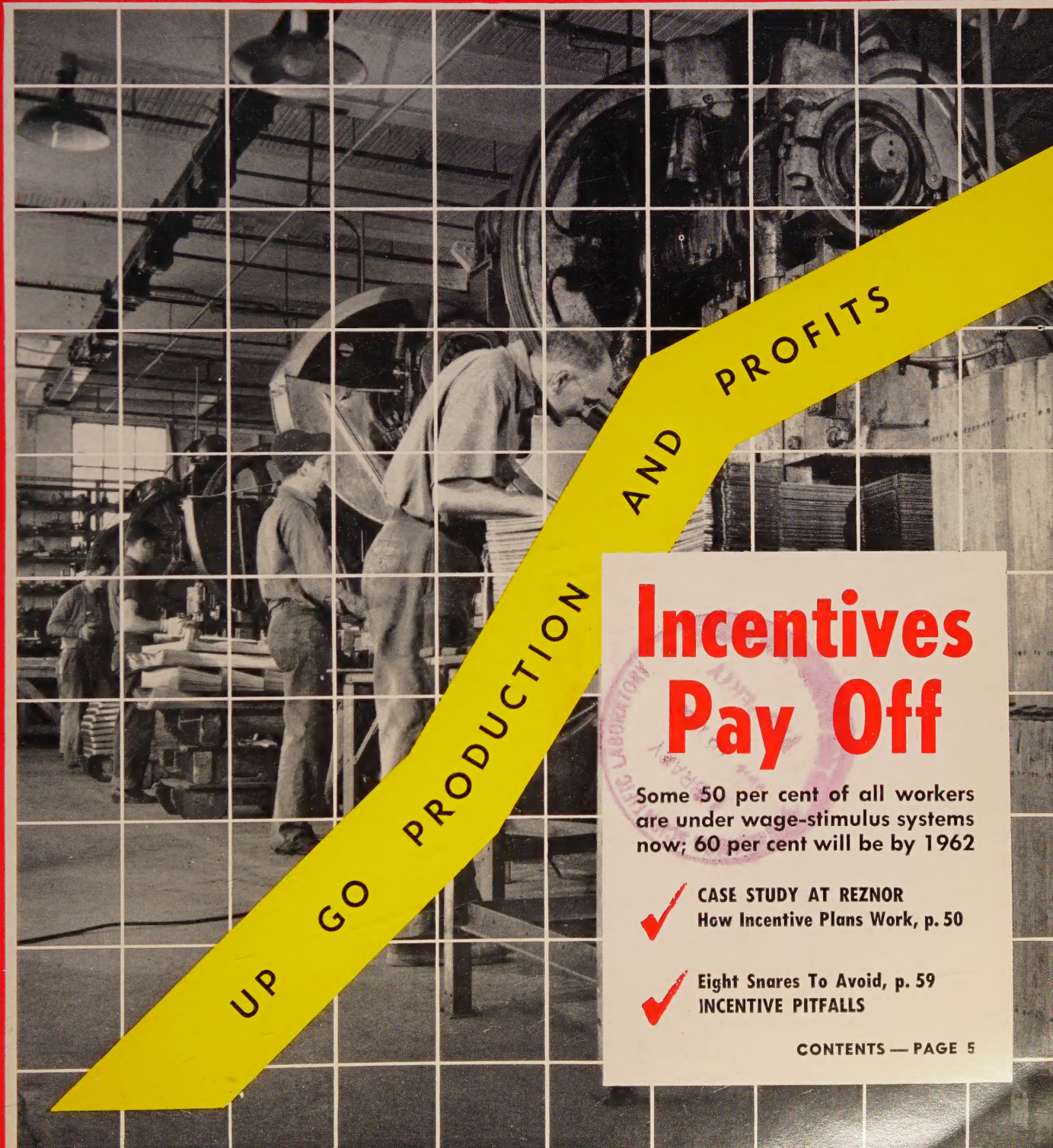
JUNE 15, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



UP GO PRODUCTION AND PROFITS

Incentives Pay Off

Some 50 per cent of all workers are under wage-stimulus systems now; 60 per cent will be by 1962

✓ CASE STUDY AT REZNOR
How Incentive Plans Work, p. 50

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INCENTIVE PITFALLS

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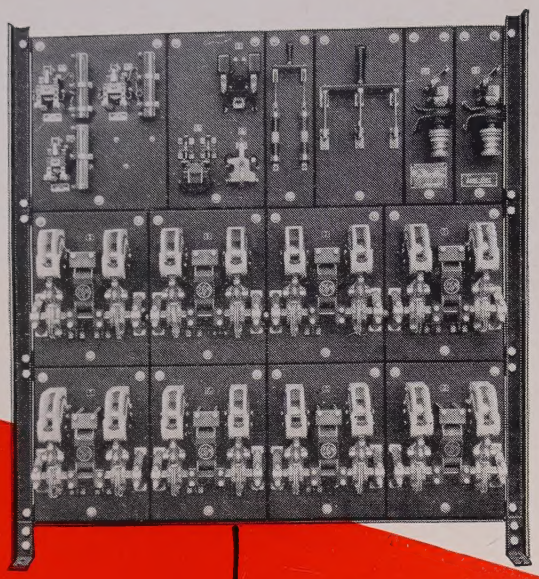
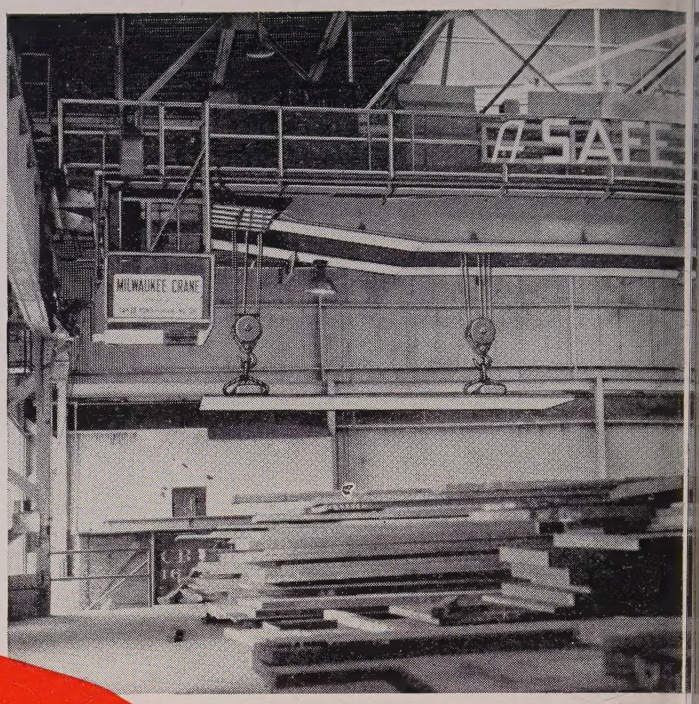


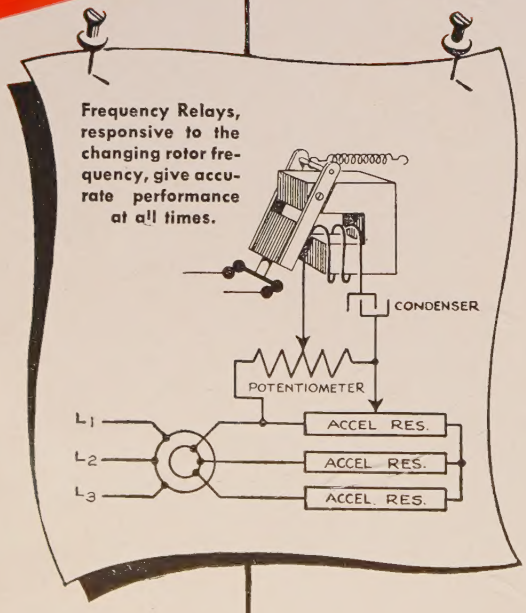


One of several Frequency-Relay Controlled Cranes helps speed steel-handling in warehouse.

EC&M FREQUENCY RELAYS

Give an EXTRA BOOST To A-c Cranes

FREQUENCY RELAYS
ACCELERATING –
– PLUGGING –
– SPEED LIMITING



MOTOR OPERATION SAFEGUARDED OVER ENTIRE SPEED RANGE

You can rely on EC&M FREQUENCY RELAYS to control a-c wound-rotor motors with precision throughout all operating speeds. Because they operate from a resonant circuit, these relays are positive in response and accurate in operation.

Used on EC&M Magnetic Hoist Controllers which are designed with *weak* torques for *good* inching, EC&M FREQUENCY RELAYS give you these inching qualities with complete safety. If the loads are heavy and overhauling, the motor does not overshoot regenerative lowering speeds. And on reversing controllers, these Relays control the plugging contactor at exact standstill and give smooth acceleration when starting up from rest or from a coasting start.

EC&M Frequency Relays, specifically developed for a-c wound-rotor motors, have improved crane performance in many ways.

It Pays To Specify E&M *Control*

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

INTRODUCING BEARCAT TOOL STEEL

Super Shock-Resisting ...Versatile, Too!

Here's a brand-new tool steel that we've been developing over the past several years. Proven in a wide variety of production tools and dies, Bearcat is a general-purpose steel especially suited for uses where shock-resistance, hot-work properties and easy machining are important.

Some of Bearcat's big features:

- Super shock-resistance
- Deep-hardening . . . in air
- Easy to machine (Brinell 197 max)
- Low distortion in heat-treatment
- Good hot-work properties
- Easily carburized for long wear

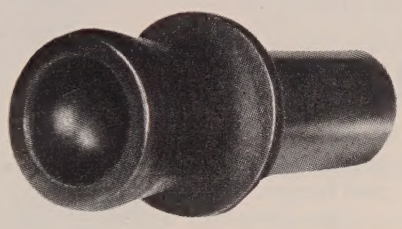
These are not just claims made for a new, untried steel! Bearcat has been thoroughly tested in applications such as rivet sets, hot gripper dies, punches, chisels, moil points, forming dies. All of the possible uses for Bearcat have not yet been explored, but we expect it to be ideal for hot headers, blanking dies, master hobs, machined-cavity molds, and many general-purpose tools and dies.

Bearcat is stocked in our mill depot and it's also available through your local Bethlehem tool steel distributor.

Typical analysis:

C	Mn	Si	Cr	Mo
.50	.70	.27	3.25	1.40

Complete data may be had by writing us for Booklet 341. Address your request to Room 1037, Publications Dept., Bethlehem Steel Co., Bethlehem, Pa.



BEARCAT DRIVES 27 TIMES MORE HOT RIVETS

Here's one example of what Bearcat can do on a job that calls for both shock-resistance and good hot-work properties. This typical rivet set, made from Bearcat, drove 43,094 rivets and was still in good condition. Rivet sets made from carbon tool steel, and used under similar conditions, drove an average of only 1566 rivets before recupping was required.

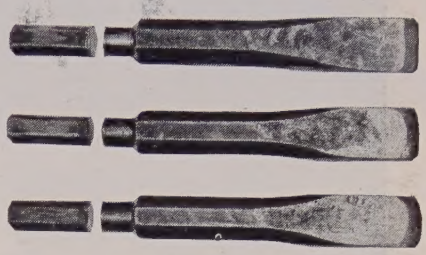
THE BETHLEHEM TOOL STEEL ENGINEER SAYS:

High-Carbon Tool Steels Can Be Carburized

Many people don't realize that carburizing can be accomplished with the high-carbon, high-chromium steels—such as our Lehigh H, which contains 1.55 pct carbon and 11.50 pct chromium. The carburizing of tools made from such steels can be either helpful or harmful, depending upon whether the carburized case is produced intentionally or accidentally.

Tools intended for light loads and long service, such as lamination dies, are often intentionally carburized before quenching. Such dies have greatly improved resistance to wear because of the carbon added to the wearing surfaces. The usual procedure is to use carburizing compound as a packing medium and heat for the normal length of time at the quenching temperature.

Sometimes an accidental carburized case results when "spent" carburizer is used as a protective packing medium when heating for hardening. Spent carburizer is often almost as active as new carburizer. An accidentally produced carburized case is not always harmful. It may even be helpful. But there are many heavy-duty tools and dies that will develop chipped or spalled edges if they become carburized. When treating tools of this type, use cast-iron chips as a packing medium during hardening.



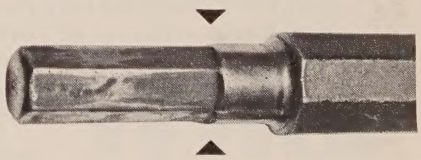
All of the chisels broke in service at the sharp change of section. While this is classed as a mechanical error, it does show how improper design can cause failure no matter how carefully a tool may be heat-treated.

Chisel Breakage Cured by Undercutting Shanks

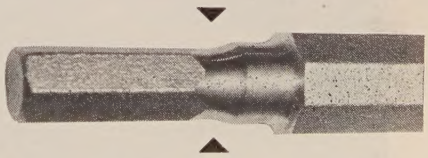
A large user of chisels—made from a top-grade shock-resisting steel, Bethlehem Omega — reported excessive breakage. One of our metallurgical sleuths soon put his finger on the trouble.

When the hexagon shanks were milled by the customer, a milling cutter was used which did not have an adequate radius. As a result, stresses were concentrated at the sharp change of section in the shank. Subjected to heavy impacts in air hammers, the chisels broke prematurely—and always at this portion of the shank.

The solution for the breakage was one that really surprised the customer. See photographs below.



This shank shows the "stress raiser," caused by the lack of sufficient radius, where the milled hexagon section meets the round section.



All of the unused chisels were salvaged by having an undercut ground on the shanks so that a ½-in. radius was provided at the source of the trouble. Despite the smaller section, these chisels gave good service. The sharp change in section was eliminated, stresses were better distributed.

PHOENIX IRON & STEEL COMPANY, Phoenixville, Pa., is one of the nation's oldest steel producers. Above, Phoenix open hearth furnace being tapped by bazooka gun.

Steel, anyone?

Or, for that matter, aluminum, Fiberglas, magnesium?

Name a basic material on industry's shopping list and chances are that one of Barium's 16 integrated companies has a hand in its production or fabrication.

No other steel producer fabricates so many different products. No other processor can match Barium's ability to turn magnesium, the versatile sea-born metal, into basic structural forms. Barium specialists are also breaking new ground in the utilization of Fiberglas for structural applications, such as aircraft shelters and barges.

This close-knit and fully integrated organization of 16 companies offers you a wealth of top-rank engineering talent and extremely flexible production facilities. They can take excellent care of your requirements for structural and fabricated materials, whether routine or highly specialized. We'll be glad to tell you how. Just drop a line on your company letterhead direct to Barium Steel Corporation, 25 Broad Street, New York 4, N.Y.

BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL COMPANY • CHESTER BLAST FURNACE • CLYDE IRON WORKS, INC. • CUYAHOGA SPRING COMPANY • EAST COAST AERONAUTICS, INC. • ERIE BOLT AND NUT COMPANY • GEOMETRIC STAMPING CO. • GLOBE FORGE, INCORPORATED • INDUSTRIAL FORGE & STEEL, INC. • JACOBS AIRCRAFT ENGINE CO. • KERMATH MANUFACTURING CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON & STEEL CO. WILEY MANUFACTURING CO.

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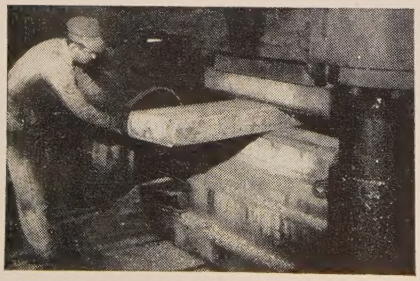
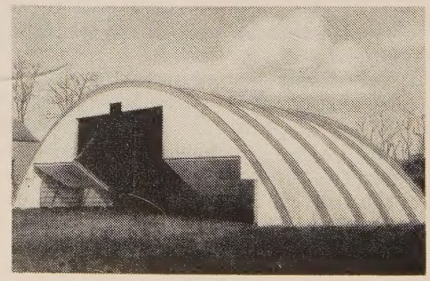
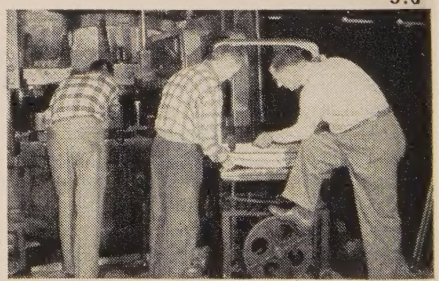


INDUSTRIAL FORGE & STEEL, INC., Canton, O., one of the nation's largest producers of heavy flat-die forgings, works in all types of steels and other metals. Here, titanium is being forged.



AT 60° BELOW, this air-borne Fiberglas-and-magnesium alert shelter protects planes and crews. Designed and built by Barium's East Coast Aeronautics, Inc., Pelham Manor, N. Y.



DOUBLE CHECK is given a radiator support for an Army truck by inspectors at Geometric Stamping Co., Cleveland, O., which turns out steel and aluminum stampings for industry.

What's unusual about this machine?

6x36 WS PREformed Right Lang Lay
Monarch Whyte Strand with IWRC

This is a 6 x 36 PREformed rope, made up of 265 wires. That means 265 individual moving parts.

Because any wire rope is a complicated piece of machinery, it must be precision built.

There are 8 different sizes of wire in this rope — each drawn to exacting specifications for material and size.

Outside wires are one size. Inside wires are another. Core and filler wires are still other sizes.

All wires are cold-drawn to precise diameters so they will fit with snug uniformity into the structure of each strand.

Each wire is protected with lubricant applied during fabrication of the rope.

Macwhyte makes a thousand and one ropes to meet the needs of every type of equipment. Each is built with the exacting care that long, low-cost service demands.

Prompt recommendations from Macwhyte engineers are readily available without obligation.

MACWHYTE WIRE ROPE

THE RIGHT ROPE FOR YOUR EQUIPMENT

Ask for G-15 Handbook

MACWHYTE COMPANY
2912 Fourteenth Avenue, Kenosha, Wis.

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies. Mill depots: New York Pittsburgh • Chicago • St. Paul • Fort Worth Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

1039

It's going on over steel in a coke quenching area

Acid vapors from quenched coke constantly attack this gas holder. In the steel mill where it is located, quenching water is used over and over. Therefore, the vapors are heavily acid laden. Corrosion is fast and severe, but INSUL-MASTIC coatings have given protection in this mill for years. That's why INSUL-MASTIC is "going on" this new tank . . . it has proven that it stops acids, alkalis and moisture.

Steel mills throughout the country are doing the same thing. On new and old coke batteries and all nearby equipment INSUL-MASTIC is being specified as the protective coating. Wherever there are vapors from quenched coke INSUL-MASTIC men are working with steel men to prevent corrosion. The INSUL-MASTIC representative near you can help you prevent corrosion in your mill as these *Superior* coatings have done in other steel mills. Write today for his address.

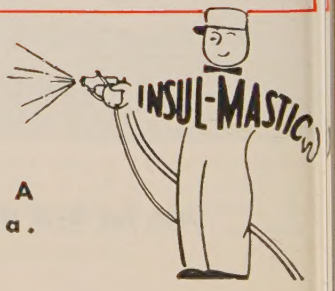
To control condensation on cold tanks and pipes use INSUL-MASTIC TYPE "D".

Think First of the Coatings that Last!

Insul-Mastic

CORPORATION OF AMERICA
Oliver Building • Pittsburgh 22, Pa.

Representatives in Principal Cities



This Week in Metalworking

STEEL

Vol. 132 No. 24 June 15, 1953

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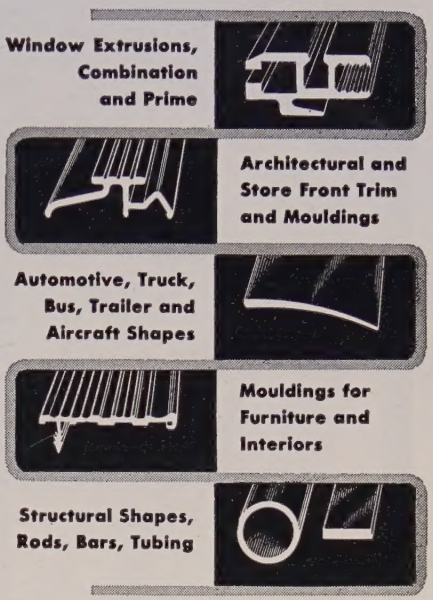
PE ALUMINUM EXTRUSIONS
designed and produced to fit your needs


Window Extrusions, Combination and Prime
Architectural and Store Front Trim and Mouldings
Automotive, Truck, Bus, Trailer and Aircraft Shapes
Mouldings for Furniture and Interiors
Structural Shapes, Rods, Bars, Tubing

If your production requirements call for a specially-designed aluminum extrusion, the skill and experience of PE design engineers and production men are available to you to help answer your specific needs. Or, it may be that a solution to your requirements can be found among the 4000 standard rods, bars, shapes, and tubing currently cataloged by Precision Extrusions and available without additional die service charge.

PE **PERSONALIZED SERVICE** and specialization in aluminum extruding assures you of prompt handling of your inquiry, careful production supervision, and extrusion quality meeting the highest standards of the industry.

PE **COMPLETE FACILITIES** include design engineering, die making, billet casting, extrusion production, and standard finishing operations.

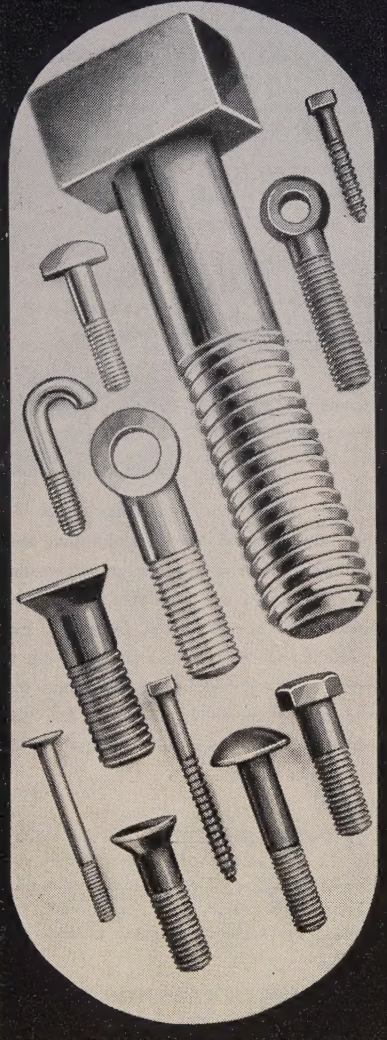
PE **ENGINEERING ASSISTANCE** is available without obligation. If your present or future plans call for quality aluminum extrusions in standard or special shapes, call on PE, or *write, on your company letterhead, for our new complete catalog.*

QUALITY • SERVICE
PE
PRECISION EXTRUSIONS
BENSENVILLE, ILLINOIS
CHICAGO: TUxedo 9-1701 • BENSENVILLE 98

THREADED SPECIALTIES

TEE BOLTS

by an exclusive method



Among Pawtucket's many specialty products, these lower-cost tee-head bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket tee-head bolts are made in standard sizes ¼" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit, if required.

BETTER BOLTS SINCE 1882

PAWTUCKET

"THE BOLT MAN"

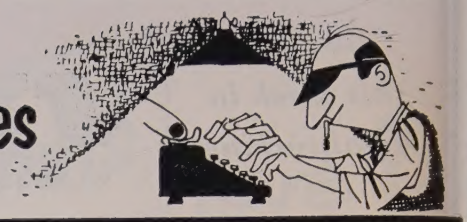
MANUFACTURING COMPANY

327 Pine Street · Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS

T.M. REG.

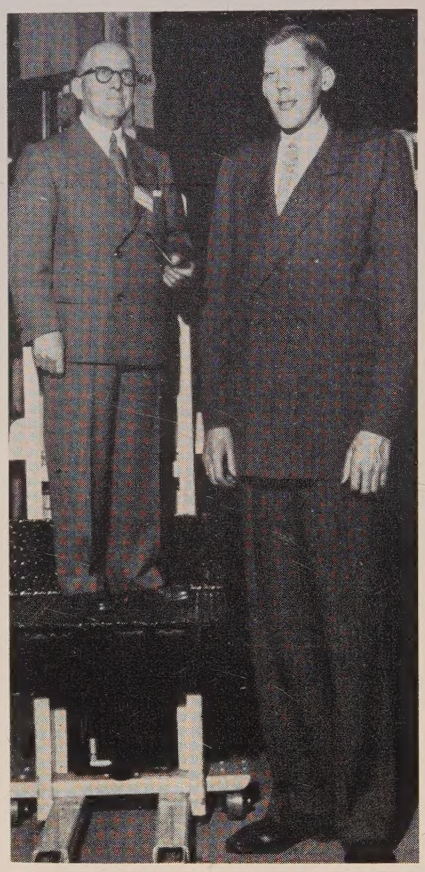
behind the scenes



Polly's Ridin' High

"Come up and see me when you're at the Materials Handling Show," said Don Koehler of the Big Joe Mfg. Co. of Chicago to L. C. Pelott, STEEL's Chicago Regional Manager. And, that's what Polly did.

Polly's the one on the portable



pallet . . . all 5 feet 3 inches of him. Looks like the rarified air up around tall Don's head has him mesmerized.

Guess it's because his system is attuned to sub-stratospheric conditions. Being suddenly skyrocketed to the dizzy height of 8 feet 3 inches on a Big Joe lift truck has left him positively speechless.

Don appears a bit startled, too. The truth of the matter is that when he extended the invitation for a chit chat, Don thought he was talking to someone else. Can't really blame the big man. At the tough angle caused by the 3 foot difference in size, Polly probably looked like someone else.

Non-census!

STEEL's Census Department is hard at it processing thousands of questionnaires being received each day from metalworking plants.

The trials our census folks face each day puts us in mind of the census taker who asked the lady of the house, "How many in your family?"

"Five," the woman answered. "Me, the old man, kid, cow and cat."

"And the politics of your family?"

"Mixed," answered the woman. "I'm a Republican, the old man's a Democrat, the kid's wet, the cow's dry and the cat's a free trader."

All's "Fare" on Trains

Earl Schultz of Detroit, Michigan, STEEL reader for the past 10 years, swears this story is a true one and that he was there when it happened.

He was taking a quickie train trip from Detroit to Chicago. Got into a coach and seated himself across the aisle from a woman who was traveling with her young son. When the conductor came by she said, "A fare for one and a half fare for the boy."

The conductor looked at the boy and said, "Lady, that boy's got long pants on."

"In that case," said the very disturbed lady, "full fare for the boy and a half fare for me."

At this critical point, the woman sitting immediately behind exclaimed, "Bless my heart, I go for nothing!"

Are You "Mr. 86-or-More"

Our researchers have come up with the fact that active STEEL readers run the age gamut from 24 years young to 85 years old.

We don't believe them. We're willing to wager a life-time subscription that STEEL has a reader, active in the metalworking or metal producing industries, who is older than the tender 85 claimed by our fact finders.

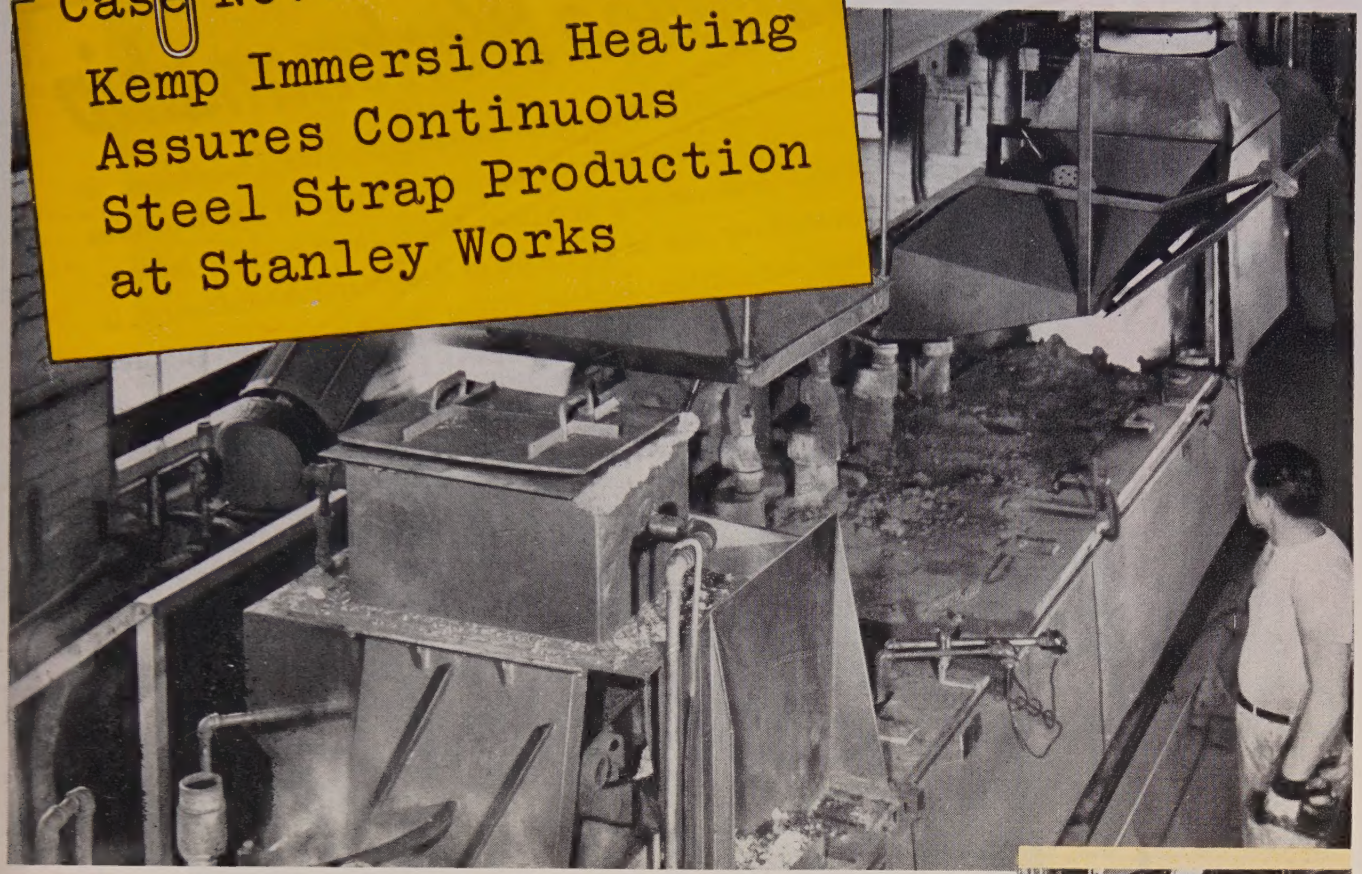
If you are he or if you know him please write to us.

Shrdlu

(Metalworking Outlook—Page 41)

Case No. 44

Kemp Immersion Heating Assures Continuous Steel Strap Production at Stanley Works



How Stanley doubled steel strap capacity overnight . . . slashed fuel costs, too

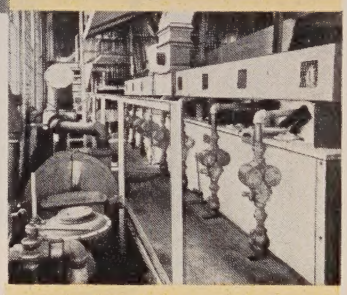
Today this bustling division of the famous Stanley Works at New Britain, Conn., turns out steel strapping on a 24 hour basis. Starting with raw, high carbon steel on giant spools, strap is semi-annealed, finished, coated and rewound again for shipping in one *continuous* process. New rolls of raw steel are simply spot-welded to the ends of rolls to eliminate any interruption.

Kemp Eliminates Bottleneck

From an output limited by the capacity of a gas underfired pot, production was doubled on the installation of a 32 ton Kemp Immersion Melting Pot. In addition, Kemp's *greater* heating surface, *faster* heat recovery, *lower* dross formation and *accurate* temperature controls meant real savings in fuel costs. In the words of Mr. Harold Heckman, plant foreman, "Through quicker heating of this pot, we are able to maintain production schedules." And unlike underfired pots, Kemp units eliminate open flame hazards and excessive room temperatures.

Let Kemp Help with Your Problems

If you're dissatisfied with your present heating or melting equipment, consult Kemp first before you make any changes. Let Kemp Engineers show you how they can solve your tempering, annealing, descaling or coating problems quickly and easily. Then just like the Stanley Works, you'll be *time* and *money* ahead.

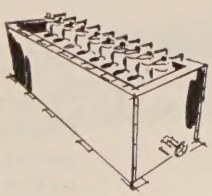


Rear view of Kemp Pot at Stanley Works shows gas feed lines, fire checks, and the Kemp Carburetor (left). Part of every Kemp installation, this carburetor assures complete combustion . . . without waste . . . without tinkering. Just set it, and forget it.

For more complete facts, ask for Bulletin IE-11. Write: **C. M. KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Md.**

KEMP OF BALTIMORE

IMMERSION MELTING POTS



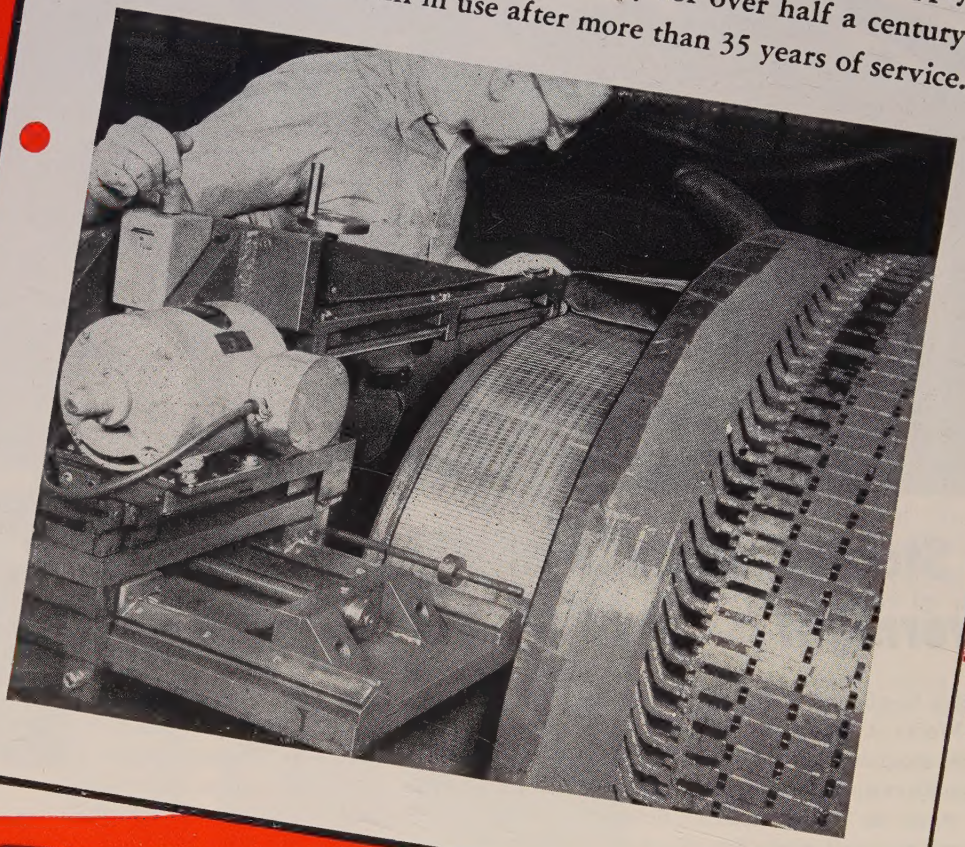
CARBURETORS • BURNERS • FIRE CHECKS
ATMOSPHERE & INERT GAS GENERATORS
ADSORPTIVE DRYERS • SINGEING EQUIPMENT

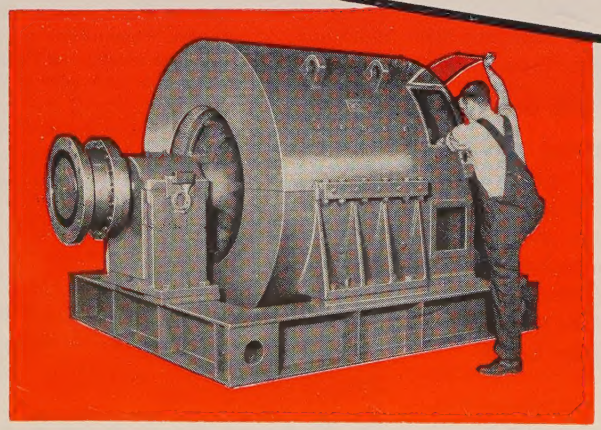
ANOTHER* EXAMPLE OF ELLIOTT Excellence IN MOTORS

*Precision Workmanship

in the careful undercutting of commutator mica segments, is characteristic of the painstaking attention to detail which insures dependable performance in Elliott large direct-current motors.

This extreme care in all stages of design and manufacture, is traditional with Elliott motors. Elliott shops have been supplying direct current machines to industry for over half a century. Some of them are still in use after more than 35 years of service.





The Elliott Mill Type DC Motor shown at left is rated 1000 hp, 200/400 rpm, 600 volts, with force ventilation covers including removable hinged doors of clear plastic for ready inspection and maintenance of commutator and brushes. This motor is driving a reversing cold strip mill.

ELLIOTT Company

DEPT. S

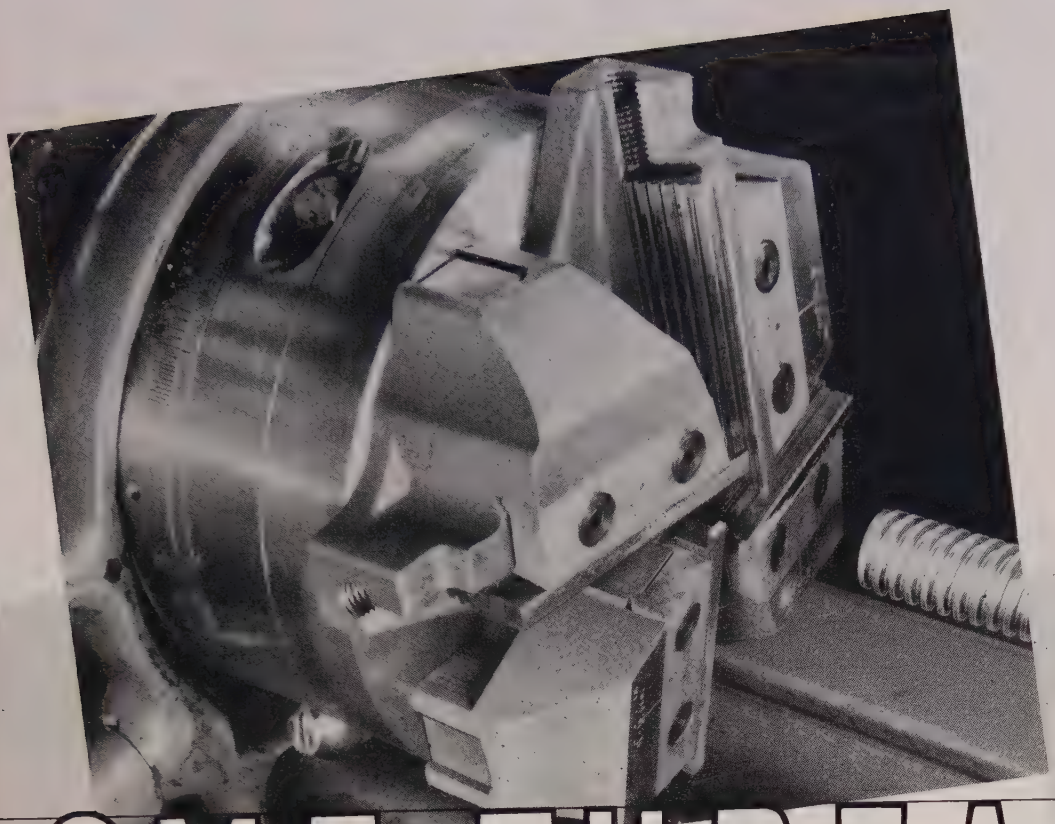
Ridgway Division

RIDGWAY, PA.

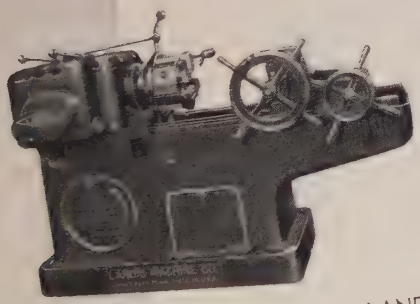
R2-7

For motors 1—200 HP: Crocker-Wheeler Div., Ampere, N. J.

Plants at: JEANNETTE, PA. • RIDGWAY, PA.
AMPERE, N. J. • SPRINGFIELD, O. • NEWARK, N. J.
DISTRICT OFFICES IN PRINCIPAL CITIES



ACME THREADS



BETTER FINISH AT LOWER COST

The Cooper Alloy Foundry Co. (Hillside, N. J.) has improved quality and reduced cost of their "certified" stainless steel valves by installing a LANDMACO Threading Machine for threading valve stems.

The 2½" LANDMACO Leadscrew Machine used is equipped with a 2½" R LANCO Head using roughing and finishing chasers with centering throats. Thread finish and concentricity is improved over previous methods, and threading time, set-up time, and tool cost reduced.

For example, ¼" pitch ½" lead Acme threads are cut on 1⅝" diameter 304, 316, and 347 stainless steel valve stems. Each valve stem is threaded with a full 1⅝" thread in 2.5 minutes floor-to-floor time—instead of 204 minutes by the previous method. The special chasers used eliminate the out-of-round condition common in long workpieces and produce coarse pitch threads of excellent finish in one pass.

This same LANDMACO Machine threads many other valve stems, requiring left-hand, right-hand, double-start and single-start threads, ranging from ⅜" to 1⅝" in diameter, with both Acme and UN thread forms. Tool cost is low—when producing a ¾" 6 pitch single Acme thread 5⅛" long, an average of 500 pieces is threaded between chaser grinds.

This case history illustrates the great possibilities of the LANDMACO Threading Machine—a better quality thread, lower thread cost, versatility of production. Can your plant profit from these benefits?

Write for Bulletin H-75

LANDIS Machine CO. 50TH ANNIVERSARY WAYNESBORO PENNA., U.S.A.

372

ONLY $270 BUYS A PACKAGE OF FULLY AUTOMATIC FIRE PROTECTION

Anyone who can measure volume . . . and can cut pipe . . . can install this ready-made fully automatic fire extinguishing system that requires no power source.

It includes Kidde's split-second rate-of-temperature-rise heat detector (the fastest detection known to the fire-fighting industry), Kidde's powerful Multijet nozzle and a 50-pound cylinder of fire-killing carbon dioxide. You even get a monometer tester. Pipe and fittings are optional.

Six Kidde Standard Paks are available for volumes from 800 up to 6,000 cubic feet.

All components of Kidde Standard Paks are the same as those used in Kidde custom-designed installations. The difference is that Kidde has pre-engineered the Paks for small hazards. And the savings on volume distribution are passed on to you!

You just can't beat Kidde Standard Paks for inexpensive night-and-day protection against normal flammable liquid hazards.

Remember, fire won't wait till you're ready. Better write today for full information.

Kidde **Walter Kidde & Company, Inc.**

660 Main St., Belleville 9, N. J.

Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.

LETTERS TO THE EDITORS

Pattern for PAs

In the May 25 issue of STEEL appears the article "Buy Your Way to Lower Costs" (p. 105) which is No. 4 of a Management Series. We consider this article to be an exceptionally fine one. It has concentrated into a relatively few words the creed of modern purchasing.

We desire to disseminate the information contained in this splendid article to key members of our purchasing division. The best way to do that is through reprints. Can we get 25 copies?

F. E. Gorton
purchasing agent
New Holland Machine Division, Sperry Corp.
New Holland, Pa.

I want to take this opportunity to say I have been impressed with the Management Series appearing in STEEL. I think your No. 4 article on purchasing is a contribution not only to the purchasing profession, but to management as a whole.

H. W. Christensen
director of purchases
Columbia-Geneva Steel Division
U. S. Steel Corp.
San Francisco

Needless to say I was very happy to see your article "Buy Your Way to Lower Costs," No. 4 in a Management Series.

At Warner Gear Division we have been constantly striving to improve purchasing policies and procedures, as well as conducting a continuous educational program. We feel that articles in periodicals such as STEEL help considerably in our training and educational program, not only within our own organization but with our suppliers and customers as well.

I wish to compliment you for your factual and comprehensive article. I am sure that all those who read the article will benefit from it, and I wish to comment particularly on the "Check list for Efficient Purchasing," which is most outstanding.

T. J. Aul
vice president and purchasing agent
Warner Gear Division
Borg-Warner Corp.
Muncie, Ind.

May we have a half-dozen reprints of the excellent article . . .

H. E. Hubbard
purchasing agent
Consolidated Machine Tool Corp.
Rochester, N. Y.

Please send me 12 copies of your excellent article "Buy Your Way to Lower Costs."

A. W. Guda
supervisor, Planning & Controls
Purchasing Division
Lukens Steel Co.
Coatesville, Pa.

We would like to get 20 reprints of the article on purchasing.

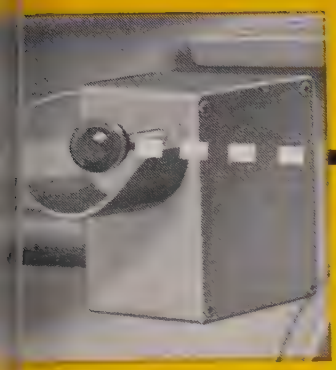
L. P. Richie
vice president & director of purchases
Oliver Corp.
Chicago

• *These and many other requests for reprints have been filled.—ED.*

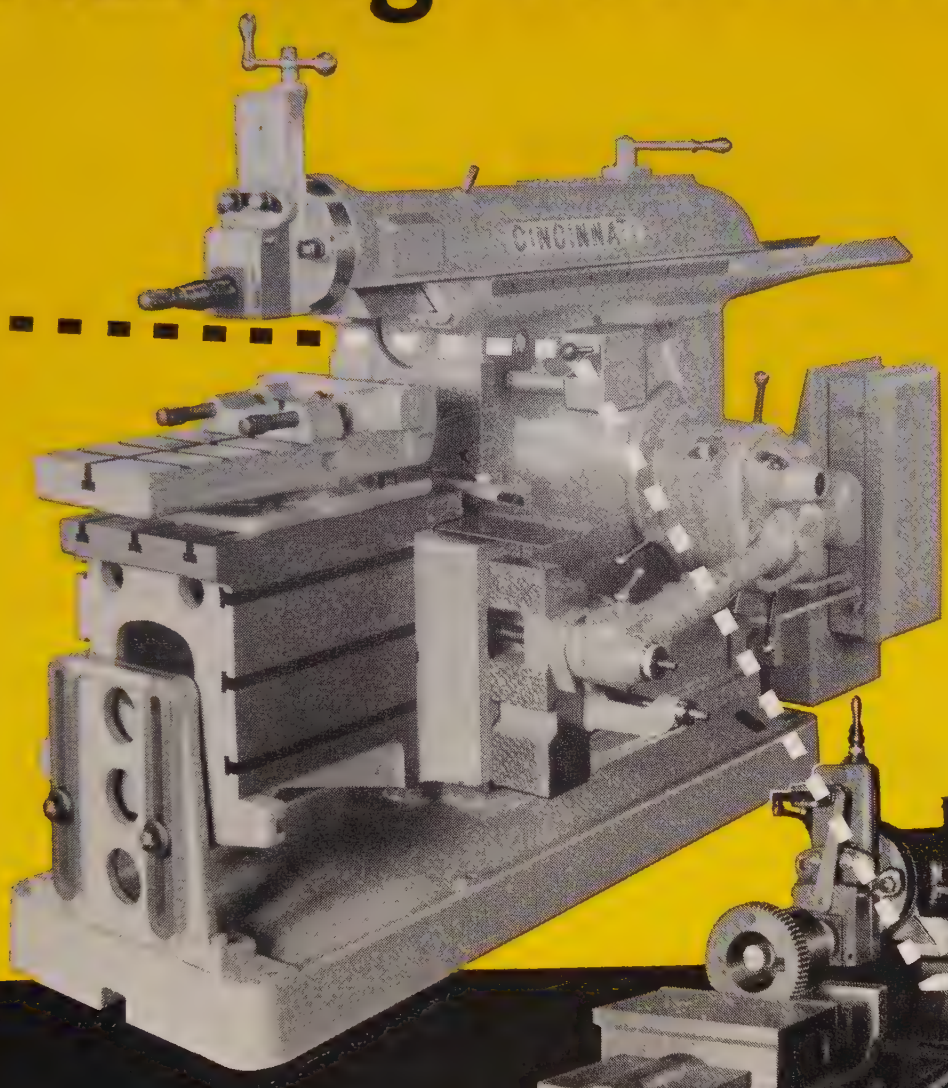
Please turn to page 12

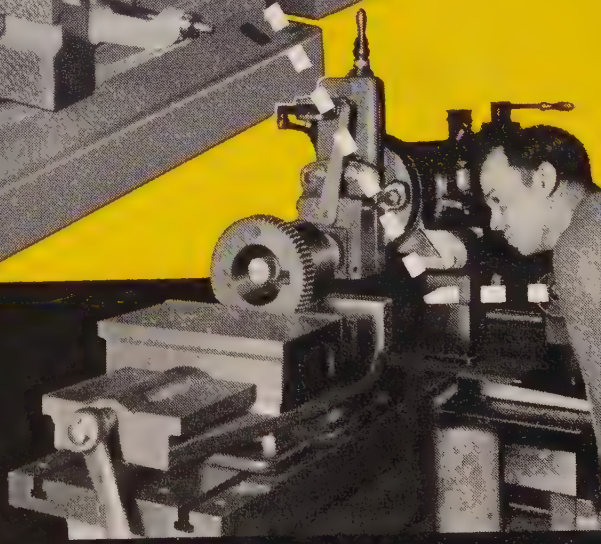
Outstanding Time Saver...

...Outstanding ACCURACY



Single Control Lever





The New Cincinnati Magnetic Clutch and Brake, with its single, convenient control lever, gives the operator the fastest, simplest and most accurate control of his Shaper and converts waste time into productive time.

This powerful clutch and brake requires no adjustment, and has a long, maintenance-free life.

Write for Cincinnati Shaper Catalog N-5.

30% Time Saving

Shaping time on 7 internal oil grooves in these steel sleeves was reduced from 12.5 minutes to 8 minutes, by the Cincinnati Electro-Magnetic Clutch and Brake.

CINCINNATI

THE CINCINNATI SHAPER CO.

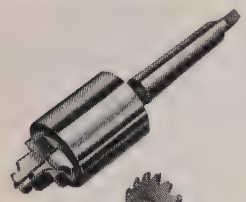
CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

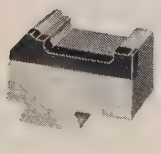
for Special Service on Carbide "Specials"

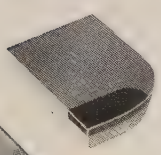
GORHAM

GORHAM

GORHAM



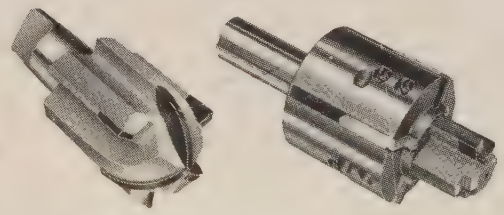




When your production machining problem dictates the use of special carbide tooling, your nearby Gorham Field Engineer can give you the right answers fast! He's an expert in the design and application of special cutting tools . . . and he provides a complete engineering service to determine your exact requirements.

He begins with your product, sketch or idea. He surveys your production operations and available equipment. He considers work material properties and required finishes and tolerances. He plots speeds, feeds and methods of tool driving. Then he develops practical design and metallurgical specifications for a special tool that's "tailor-made" for your application. And his recommendations are backed by Gorham's more than thirty years' experience in the design, manufacture and heat treatment of fine cutting tools.

Yes, your nearby Gorham Field Engineer is a helpful man to have around! If you haven't yet met him, write for his name, or send details of your problem direct, and we'll have him get in touch with you promptly.



Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

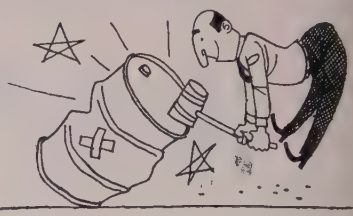
14401 WOODROW WILSON • DETROIT 3, MICHIGAN

WEST COAST WAREHOUSE: 576 North Prairie Ave., Hawthorne, Calif.

LETTERS

Concluded from page 10

Old Drums Made New



May we have 200 reprints of your very informative and interesting article "Used Steel Drums" (May 18, p. 48).

M. A. Smith
executive secretary
National Barrel & Drum Association Inc.
Washington

• *Sent.—ED.*

Battle Call Against Rust

In the Apr. 6 issue of STEEL is the article "How You Can Fight Corrosion" (p. 102) which we would like to obtain for circulation to our sales organization. If reprints are available, will you enter our order for 1000. If you do not have reprints on hand, may we have your permission to reproduce them by offset?

W. Standerwick
National Carbon Co.
New York

• *The 1000 reprints have been sent.—ED.*

Sleuthing Simplified

Problem: Given the trade name of a particular steel, find the source of supply.

We are trying to locate the source of supply of "Tri-mo" steel. Can you help us out?

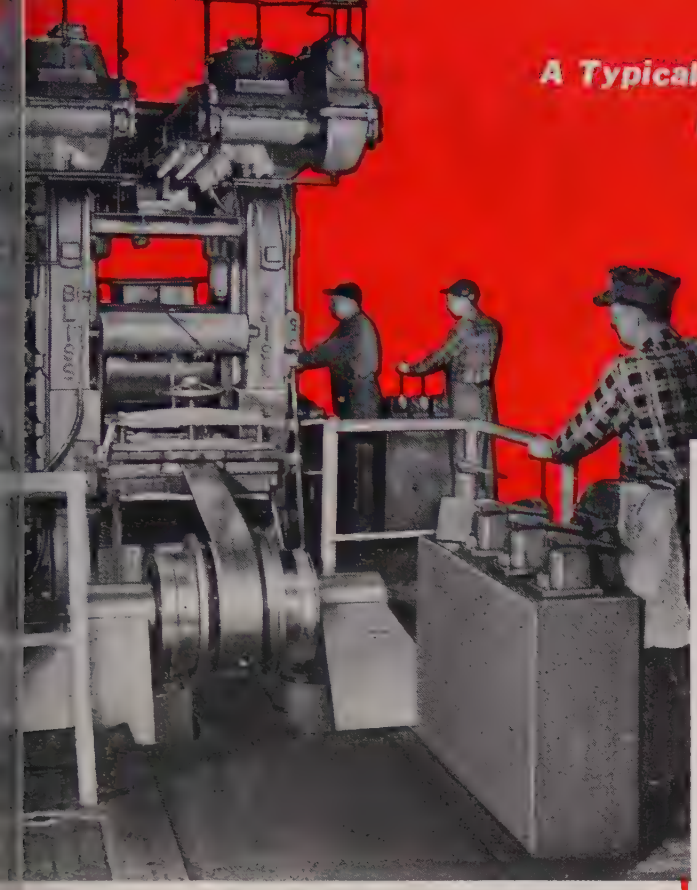
M. L. Schulte
Engineering Department
Bennett-Ireland Inc.
Norwich, N. Y.

• *STEEL's "Guide for Selecting Tool Steels and Carbides" lists a "Tri-mo" tool steel on p. 29 under listing number 46. The supplier for that steel is Uddeholm Co. of America Inc., 155 E. 44th St., New York 17. The Tool Steel Guide, which appeared as part of the June 16, 1952 issue of STEEL, has a rather extensive index of materials by trade names.—ED.*

Thank you kindly for giving us the name of the supplier of "Tri-mo" tool steel. It was pleasant to note that you do have an index of materials by trade name. Since we have not retained the 1952 issues of STEEL in our files, would it be possible to have another copy of the Tool Steel Guide?

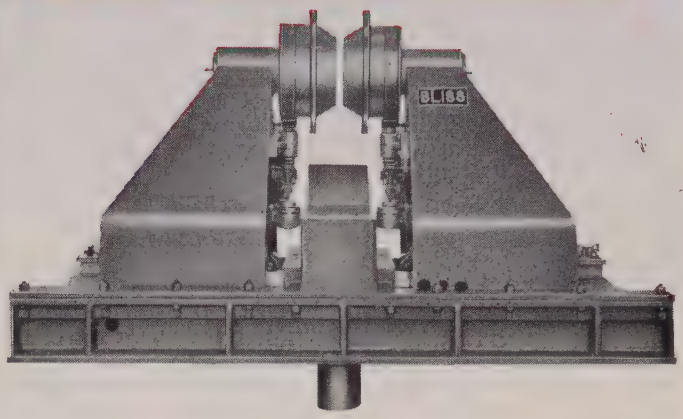
M. L. Schulte
engineering department
Bennett-Ireland Inc.
Norwich, N. Y.

• *Sent.—ED.*



A Typical Example of Bliss Service Revitalizing Existing Equipment

at Thomas Strip Division
PITTSBURGH STEEL CO.
Warren, Ohio



PNEUMATIC BRAKE, directly beneath the drums, controls tension to prevent over-running of coil. Loading ramp, with coil stops, located beneath floor level, can be used to speed coil handling.

Bliss Unwinder

Eliminates Scratching of Strip...

BOOSTS PRODUCTION 15%

THOMAS STRIP DIVISION, Pittsburgh Steel Co., has licked the problem of scratching their high carbon and No. 3 finish steel strip. They've installed a Bliss cone-type double-stub unwinder that feeds their strip quickly and smoothly, without looping or over-running. And, as Assistant General Superintendent M. D. Blasier reports: "We not only retain perfect surface characteristics and eliminate scratches—we've also increased our production by 15% with the Bliss unwinder."

In this particular installation, the Bliss unwinder is used with a Bliss 4-high mill. But it can be used with practically any mill and render *the same satisfactory results*. Additional refinements such as the drag generator tension control and the automatic strip-alignment feature are often provided with this type unit.

Bliss' 52-page Rolling Mill Brochure describes the unwinder and other accessory equipment that can help you up-grade speed and quality in your mill. It's a valuable source of production ideas. Send for a copy, study it, and then call Bliss' Engineering Department for a frank appraisal of your problem. That's what Thomas Strip Division did!

E. W. Bliss Company · General Office: Canton, Ohio

ROLLING MILL DIVISION: SALEM, OHIO

E. W. Bliss (England) Ltd., Derby, England

E. W. Bliss Company (Paris), St. Ouen sur Seine, France

U. S. Plants in Canton, Salem and Toledo, Ohio; and Hastings, Michigan

Branch Offices in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven New York, Philadelphia, Rochester, Toledo; and Toronto, Canada.

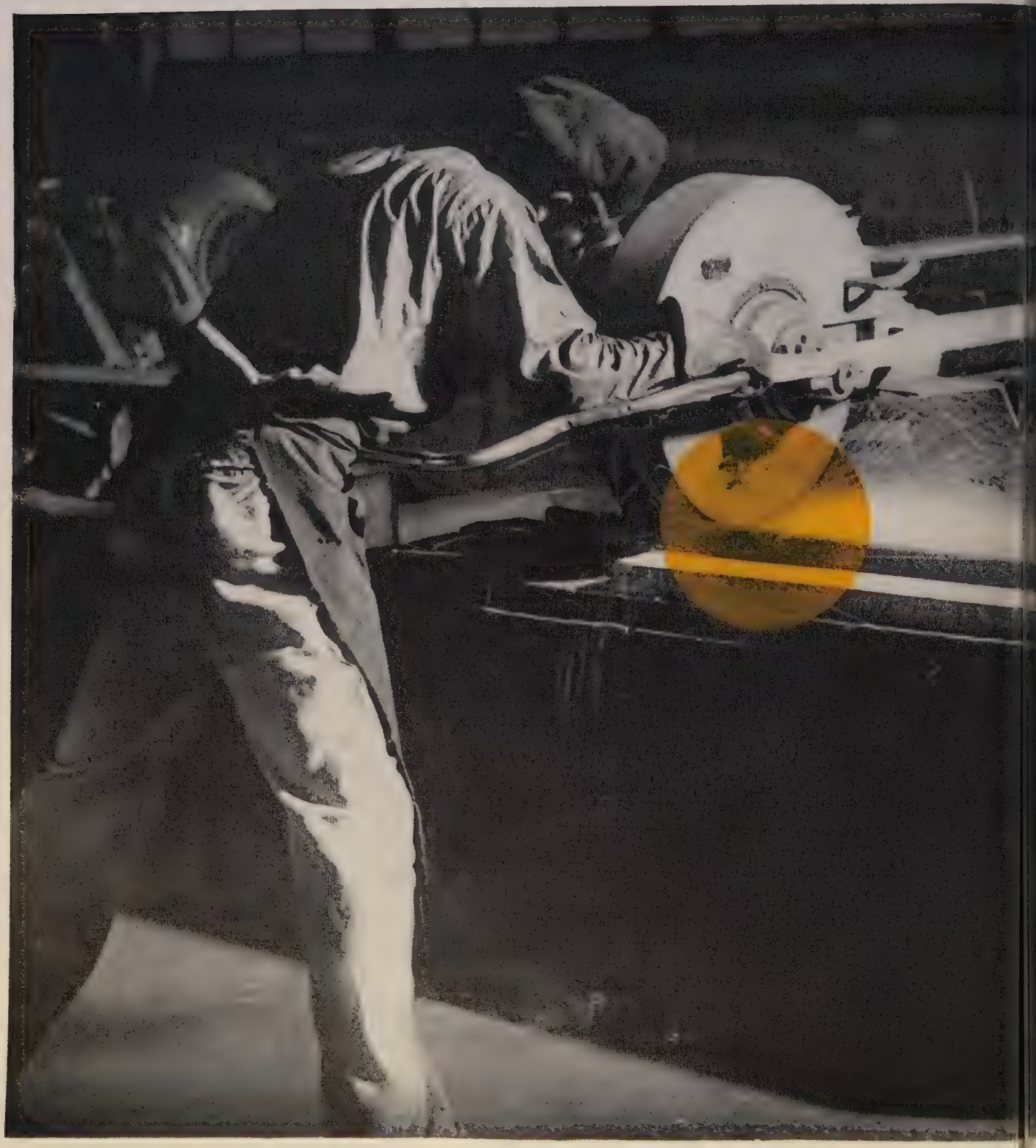
West Coast Representatives: Moore Machinery Company, Los Angeles and San Francisco; Star Machinery Company, Seattle. *Other dealers* in United States cities and throughout the world.

Remember:

...or Presses, ROLLING MILLS and Special Machinery... **It's Bliss**

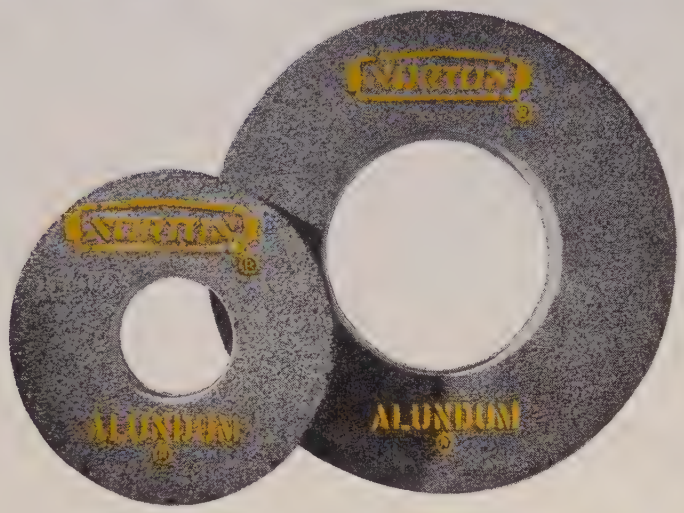
NOW!

Condition alloy steel at



lower cost with Norton

BZZ wheels



Get the "TOUCH of GOLD" in your billet grinding

How do you figure your costs of grinding alloy steel billets, slabs, sheet bars and strips?

In terms of

— cost per ton ground?
— cost per pound of metal removed?
— man-hours per ton ground?

Any way you reckon it, Norton BZZ Wheels will register by far the best score on your cost sheet. After six years of developing and field-testing, these exceptional wheels are making good in a big way.

Here are the benefits they're bringing to mills across the country:

Advantages To Management—Lower cost grinding . . . increased productivity . . . greater safety . . . better finish.

Advantages To Operators—Faster cutting . . . easier handling . . . safer.

Let us prove how Norton BZZ Wheels can bring these same advantages — the sure "Touch of Gold" — to your own conditioning of alloy steel. Your Norton Abrasive Engineer will gladly arrange a test in your mill. Or write direct to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities — listed in your telephone directory, yellow pages, under "Grinding Wheels." *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

NORTON
ABRASIVES

Making better products . . . to make other products better

NOW you can

BRIGHT-ANNEAL STAINLESS

on a continuous production basis, with The SARGEANT & WILBUR Controlled Atmosphere CONVEYOR FURNACE

PARTS MADE OF STAINLESS can be

BRIGHT-ANNEALED,

BRIGHT-HARDENED, or

BRIGHT-BRAZED without oxidation . . . they come out scale-free, bright, and clean. No pickling required, no tumbling, no sand blasting.

With our special S. & W. alloy for bright-brazing stainless, the color matches the metal; resists dulling; and the joint is practically invisible. *Gold and silver parts* are soldered in the same continuous-production furnace with equal success.

Your samples processed free. If you want to see some of your own work bright-annealed, bright-hardened, or bright-brazed in a *conveyor furnace*, send us samples and specifications.

SARGEANT & WILBUR, INC.
180 Weeden St.
PAWTUCKET, R. I.

Send your illustrated folder "How to BRIGHT-ANNEAL STAINLESS in the S. & W. Conveyor Furnace."

Name .....

Company .....

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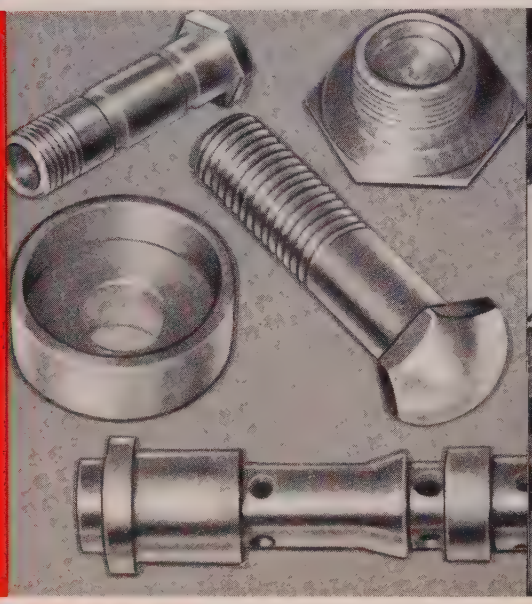
brings you better results and makes your job easier...

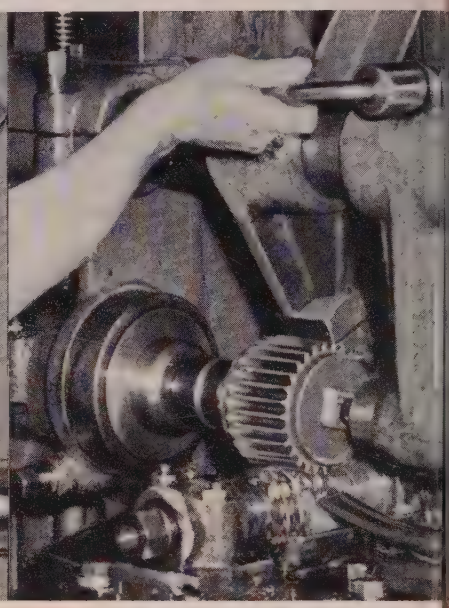
Standard Oil's Metalworking Service brings you the right product...for the right job...right on schedule!

There's no other like it in the Midwest! Standard Oil's Metalworking Service is completely personalized to meet your individual needs. It brings you one of the most complete lines of metalworking products on the market. It offers you the help of a specially trained, experienced metalworking specialist who has headquarters near your plant. It gives you delivery of metalworking products from a warehouse that's right in your own backyard. Described here are the outstanding products in Standard's complete line. You'll find exactly the ones to give you the best results.

STANICUT 62FC increased screw machine production of aluminum alloy valves from 97 to 125 per hour . . . gave better finish and longer tool life—5,000 pieces between tool grinds. This light-colored oil is ideal for tough non-ferrous jobs.

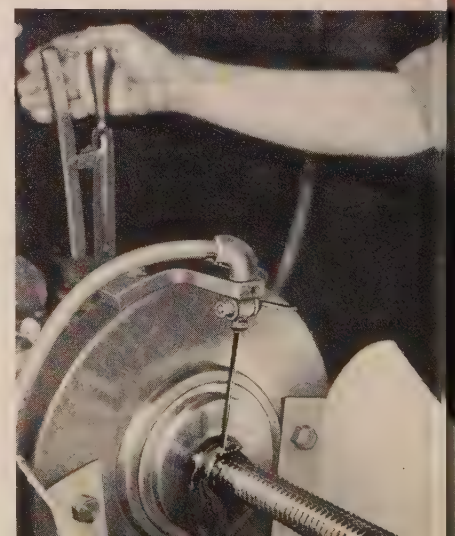


STANICUT 107 BC handled wide variety of operations for midwest plant. Metals machined include brass, copper, bronze, aluminum, and steel. This cutting oil gives fine results on high speed operations using free cutting steel where requirements are not too severe and low cost is important.



PREMIER Cutting Oil Extended hob life 75 and increased production of spur gears ma from free machining steel. Available in t grades, Nos. 110 and 150, this sulfurized a compounded oil meets demands for a lo priced, light-colored, general-purpose c ting oil.

ACME Cutting Oils cover wide range of o erations. They are dark-colored, sulfuriz mineral oils. Grade No. 80 for high spe automatics . . . No. 110 for general automa work, deep drilling . . . No. 150 for high spe operations and broaching . . . No. 200 for l speed operations and severe work.



STANICUT Cutting Oils are special-duty products developed to meet today's most exacting requirements and highest production schedules.

STANICUT Oil 117 BCS for high speed operations where steels of lower machinability than free cutting screwstock are used.

STANICUT Oil 126 BCS, relatively light-colored oil, contains right amount of active sulfur for rather severe, high speed operations.

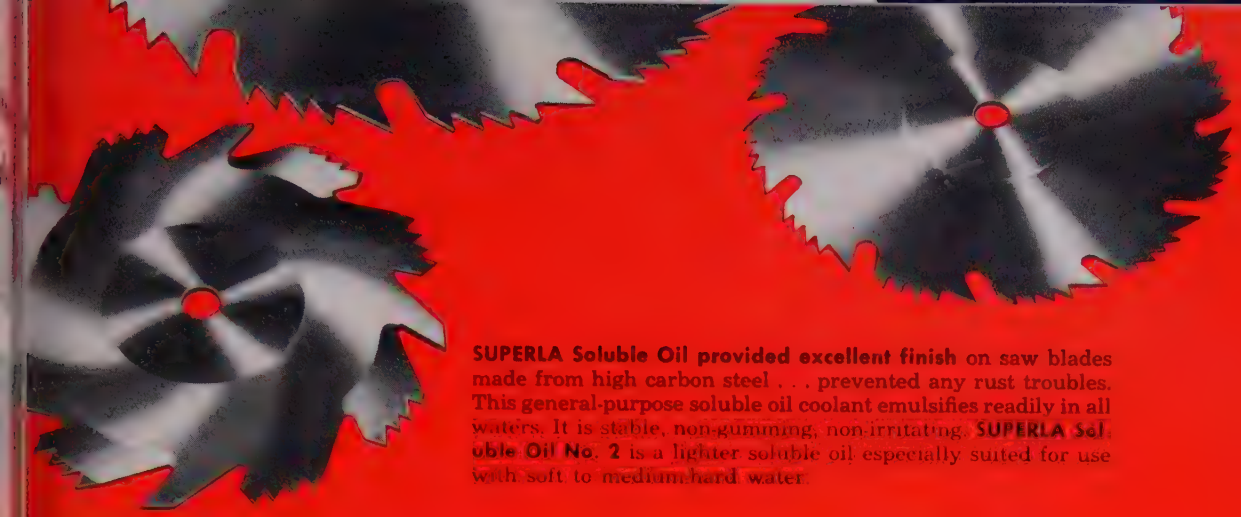
STANICUT Oil 137 BCS has a high sulfur content and special compounding for severe, high speed operations on either turret lathes or automatics. Suitable for either brass or steel.

STANICUT Oil 155 CS, containing maximum active sulfur and chlorine, for very tough alloys of SAE 3000 and 4000 series, especially those that tend to "smear."

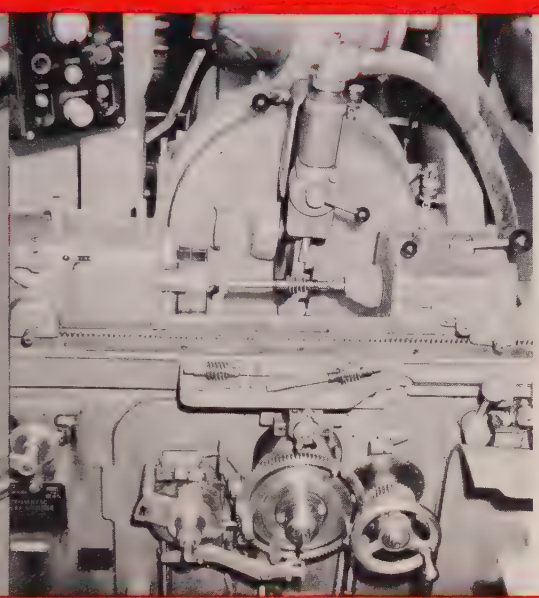
STANICUT Oil 166 BC—may be used as a dual-purpose oil for those desiring this type of product—non-corrosive, provides lubrication for bearings yet chlorinated and compounded sufficiently for cutting operations on free machining steels, brass and copper.

STANICUT Oil 208 BCS, high sulfur and chlorine content, yet good color and odor . . . for tough alloy steels and severe operations.

STANICUT Oil 309 BCS, a sulfurized and chlorinated oil, for heavy broaching, threading, and tapping of soft stringy steels. Can be blended with paraffin oil to handle less severe work.



SUPERLA Soluble Oil provided excellent finish on saw blades made from high carbon steel . . . prevented any rust troubles. This general-purpose soluble oil coolant emulsifies readily in all waters. It is stable, non-gumming, non-irritating. **SUPERLA Soluble Oil No. 2** is a lighter soluble oil especially suited for use with soft to medium-hard water.



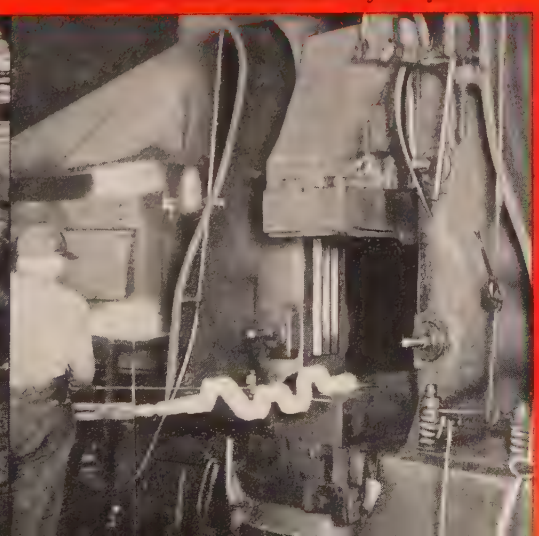
STANDARD

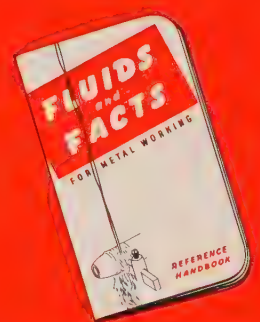
STANICOOL HD Soluble Oil handled more jobs for a midwest plant than could conventional soluble oils, gave good results in tapping, threading, drilling, and milling of high carbon, high chrome steels and stainless steels. Special compounding enables this oil to handle severe cutting jobs.

SUPERLA Thread Grinding Oil "A" stopped burning of surfaces on worm gears, increased grinding speed 20%, gave finish of between 14 and 20 microinches. Each of three grades has the proper viscosity, compounding, sulfur and chlorine to produce best results in service intended.

STANOSTAMP Compound "C" cut die polishing on this stamping job – 90,000 more pieces between polishings. Two grades of STANOSTAMP meet widest requirements found in sheet metal processing: Grade "C" for average jobs, easy removal . . . Grade "S" with sulfur for heavy jobs.

STANOLIND Forge Die Compounds have increased materially life of dies and tools in forging of hot metal. STANOLIND "Medium" has heavier consistency for general work. STANOLIND "Heavy" is especially suited for intricate forging. Both can be applied by swab, further distributed by air jet.

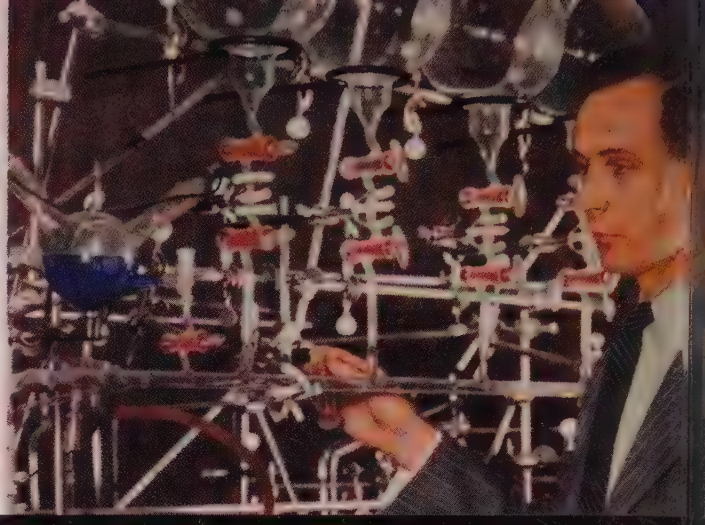




SEND FOR THIS VALUABLE HANDBOOK. It's a handy, pocket-size manual packed with facts and tables useful to shop men. Address your card: Standard Oil Co., 910 S. Michigan Ave., Chicago 80, Ill.

HERE'S HOW Standard Oil's Metalworking Service makes your job easier . . .

Standard Oil's Metalworking Service makes your job easier three ways...bringing you all of the metalworking products you need...



1 *Backed by an active technical and research program*

In one of the world's largest industrial laboratories, research experts not only work to give you the most advanced metalworking products but are available to help you solve special metalworking problems. They help make your job easier.
Standard's large, modern refineries produce and assure consistent high quality.

2 *Sold by trained metalworking specialists*

Standard's metalworking specialists bring you the benefits of special training in Standard's own Engineering School and a wealth of job experience. One of these men has headquarters near your plant. He will work closely with you, give you the help you need when you need it, to make your job easier.

3 *Supplied on schedule from nearby warehouses*

Wherever you are in the Midwest, there's a Standard warehouse and office right in your own backyard! Adequate stocks of the metalworking products you need are near at hand . . . no need to stockpile oils in your plant . . . no need to worry about delivery delays. A local phone call brings you the product you need, delivered promptly to your plant. It helps make your job easier and operation in your plant more efficient.

Call your nearby Standard Oil metalworking specialist

Put Standard Oil's personalized metalworking service to work for you. Phone your local Standard Oil (Indiana) office.

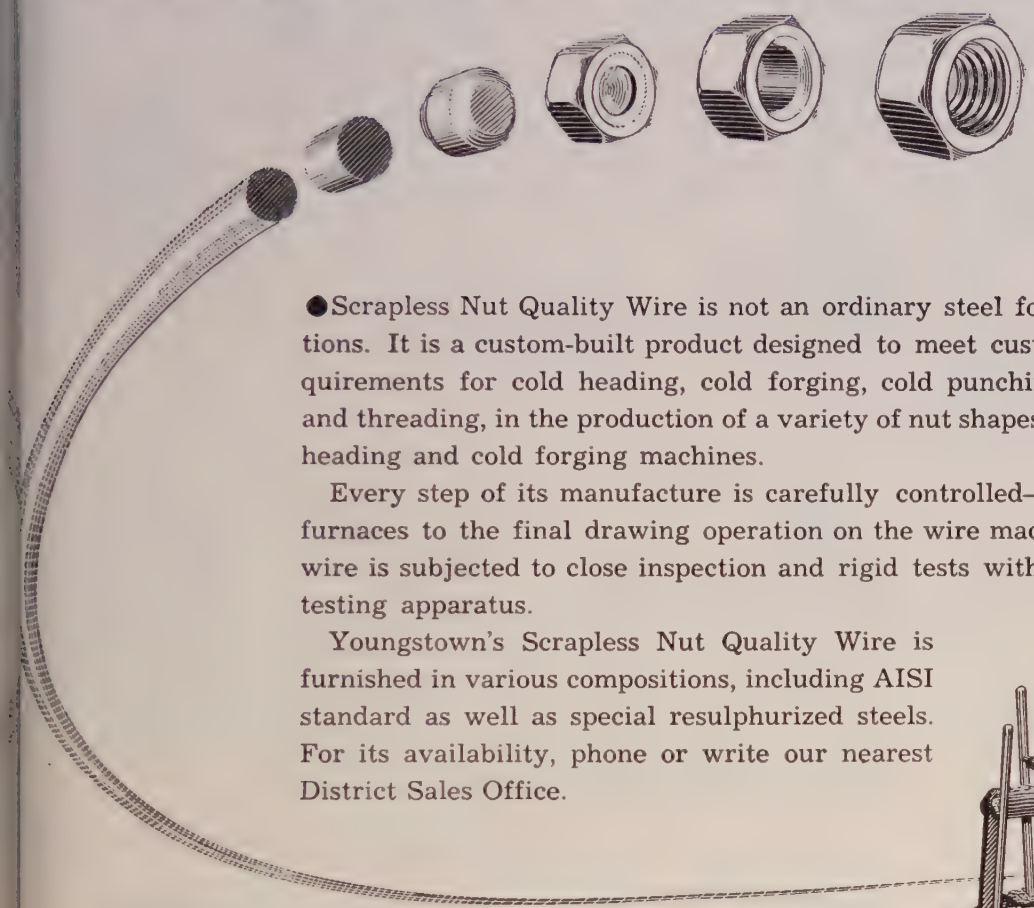
STANDARD OIL COMPANY

STANDARD

(Indi

Custom built to customers' requirements...

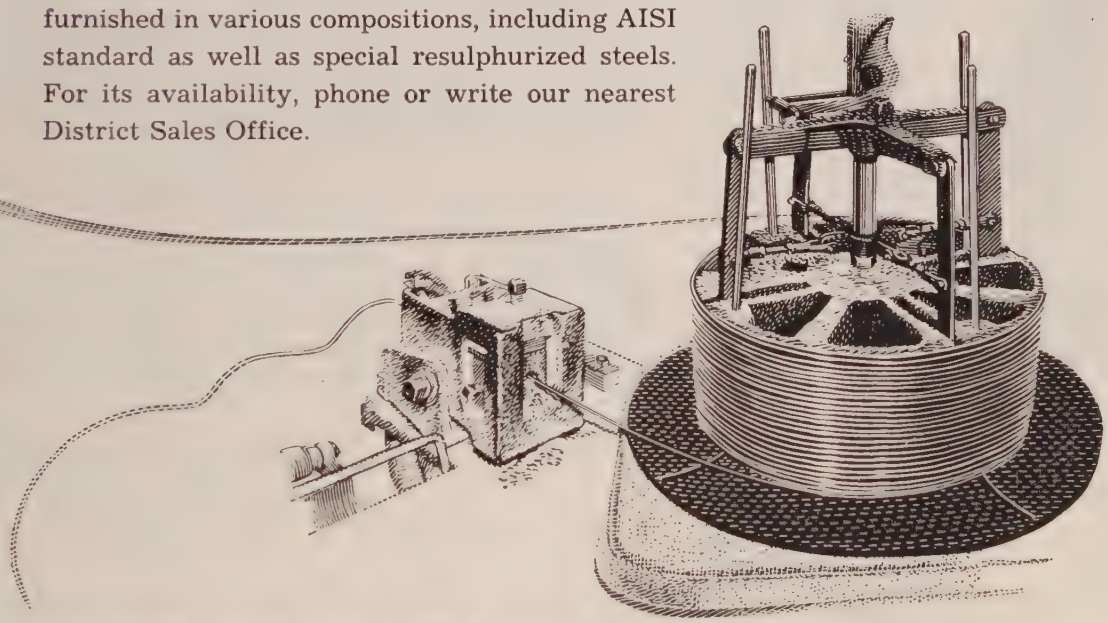
YOUNGSTOWN SCRAPLESS NUT WIRE



●Scrapless Nut Quality Wire is not an ordinary steel for common applications. It is a custom-built product designed to meet customers' specific requirements for cold heading, cold forging, cold punching, cold expanding and threading, in the production of a variety of nut shapes on continuous cold heading and cold forging machines.

Every step of its manufacture is carefully controlled—from the melting furnaces to the final drawing operation on the wire machines. Each coil of wire is subjected to close inspection and rigid tests with modern electrical testing apparatus.

Youngstown's Scrapless Nut Quality Wire is furnished in various compositions, including AISI standard as well as special resulphurized steels. For its availability, phone or write our nearest District Sales Office.



QUALITY YOUNGSTOWN SERVICE

Youngstown SCRAPLESS NUT QUALITY WIRE

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices: Youngstown, Ohio - Export Office: 500 Fifth Avenue, New York 36, N. Y.

PIPE AND TUBULAR PRODUCTS - CONDUIT - BARS - RODS - COLD FINISHED CARBON AND ALLOY BARS - SHEETS - PLATES - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RAILROAD TRACK SPIKES

What's Screwy? by Phillips

"Very fancy, dear, but wouldn't it be cheaper to use Phillips Cross-Recessed-Head Screws?"

PERFECTLY MATED!
Only Phillips Drivers are perfectly mated to Phillips Screws. Look for the name Phillips on the shank.

FREEDOM FROM DRIVER SKIDS is just one of the advantages of Phillips Screws. No danger of marring the finish. In addition, they drive in much faster. And they add to the structural strength of the product, too — set up tighter and resist loosening under vibration.

The identifying X on the cross-recessed-head identifies the X-tra quality of Phillips Screws at a glance. Be sure to specify "Phillips."

PHILLIPS *Cross-Recessed-Head* SCREWS

X marks the spot... the mark of extra quality

AMERICAN SCREW COMPANY • ATLANTIC SCREW WORKS, INC. • THE BLAKE & JOHNSON CO.
CENTRAL SCREW COMPANY • CONTINENTAL SCREW COMPANY • THE EAGLE LOCK COMPANY
ELCO TOOL AND SCREW CORPORATION • GREAT LAKES SCREW CORPORATION • THE H. M. HARPER CO.
THE LAMSON & SESSIONS COMPANY • NATIONAL LOCK COMPANY
THE NATIONAL SCREW & MANUFACTURING CO. • PARKER-KALON CORPORATION
PHEOLL MANUFACTURING CO. • ROCKFORD SCREW PRODUCTS CO. • SCOVILL MANUFACTURING CO.
SHAKEPROOF DIV. OF ILLINOIS TOOL WORKS • THE SOUTHINGTON HDWE. MFG. COMPANY
STERLING BOLT COMPANY • WALES-BEECH CORP.

TODAY'S . . . AND THE FUTURE'S . . . FINEST FASTENER

How Warner & Swasey Automatics ut costs for Thor Power Tool Company

Take a look at some of the typical time and cost savings delivered by Warner & Swasey 5-Spindle Automatic Bar Machines at Thor Power Tool Co., Aurora, Illinois...

REDUCTION GEAR BLANKS

Savings pay for several new machines!

Large variety required—in lot sizes of 150-1500 pieces. Material: 8460 Steel.

Previous method: 2 single-spindle automatics, running continuously.

NOW—one Warner & Swasey 5-Spindle Automatic does complete machining in equivalent ..of 4 days a week.

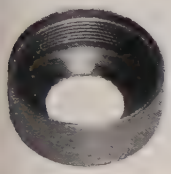
DRIVE SHAFT IMPACT SPINDLES

Accuracy and rigidity deliver 4 to 1 savings!

Material: Super tough rivet set alloy, especially made for Thor.

Previous method: Roughed on single-spindle automatic, straddled to length on turret lathe—both machines running at half speed.

NOW—finished for grinding in single operation on Warner & Swasey 5-Spindle Automatic running at full speed.

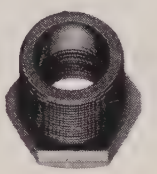


THIN WALLED PROTECTION NUT

Combines operations at high removal rate!

Previous method: Three operations—rough turned, relief cut made in second operation, Class 3 threads hobbed in third. Cost of last step alone ran 20¢ per part.

NOW—finished in one operation in 132 seconds on Warner & Swasey 5-Spindle Automatic.

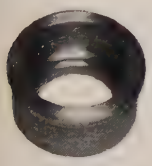


REDUCER BUSHING

Cuts Class 4 threads in same operation—costs reduced 8.5 to 1!

Previous method: Threads milled, following rough forming on single-spindle automatic.

NOW—Complete machining finished on Warner & Swasey 5-Spindle Automatic in one operation in 27 seconds!



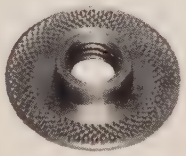
LOCK COLLAR

Slashes machining time on longer runs!

Quantities: 20,000—30,000 pieces.

Previous method: Run on conventional multi-spindle automatics in 75 seconds.

NOW—on Warner & Swasey 5-Spindle Automatics parts made in 27 seconds!



SANDING PAD NUT

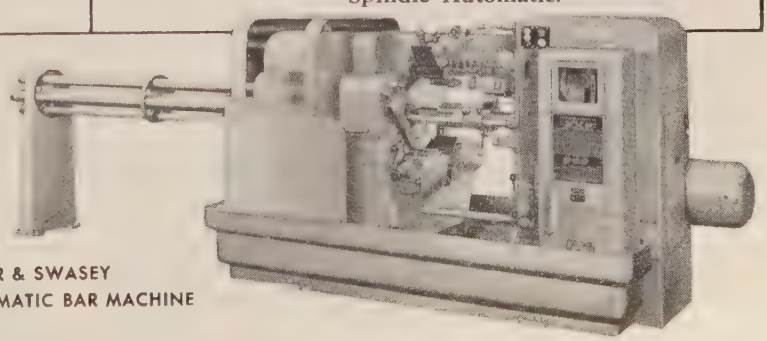
One machine does work spread over 3 departments!

Problem: To thread part at perfect 90° angle to outside face, and hold concentricity.

Previous method: Part machined in 3 different departments. Difficulty was experienced in holding piece in fixture for knurling.

NOW—Thread tapped into bar stock and balance of cuts made, including knurling, in one operation on Warner & Swasey 5-Spindle Automatic.

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

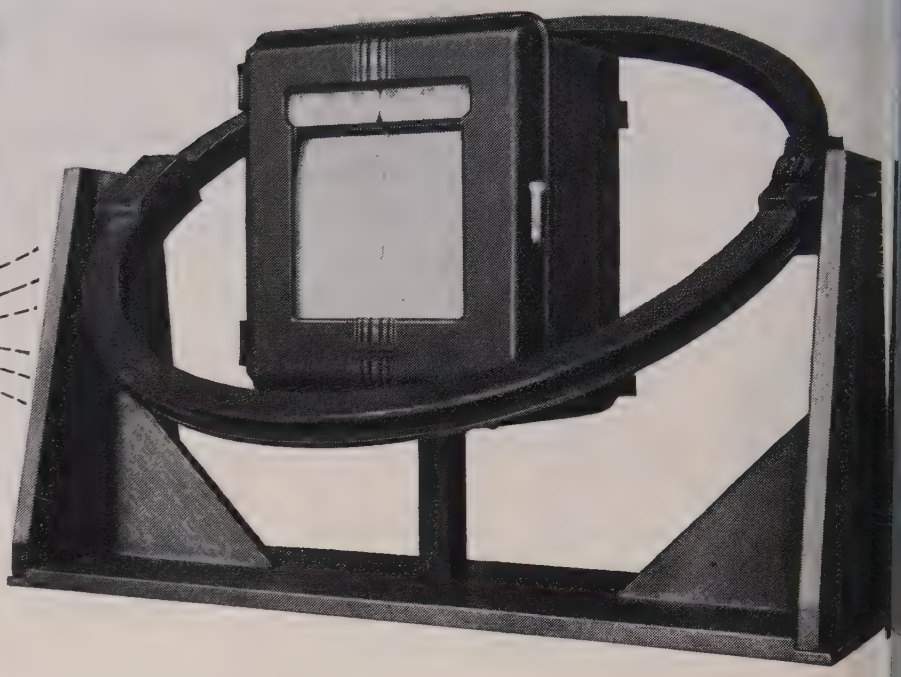


WARNER & SWASEY
5-SPINDLE AUTOMATIC BAR MACHINE

OU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

Here's how L&N engineers verify Speedomax resistance to stray electrical fields. The ring is a Helmholtz coil, adjustable for a wide variety of field effects.

Speedomax is engineered for FIELD service



● Built into every Speedomax recorder and controller is a high degree of indifference to stray electrical fields. And this is one of its most useful characteristics in almost any job. It means that you can install a Speedomax near a big motor, power line or X-Ray machine—any electrical equipment in fact—and you'll probably see no effect at all from surrounding electronic noise and "junk".

The reason for this indifference to stray fields goes back through the adjustment, building and design of the instrument, to its basic engineering. Speedomax has an *electronically-clean measuring circuit*, as well as clean signal and amplifier circuits.

This clean design includes a bifilar-effect slidewire, to eliminate any objectionable inductance at that point. It includes our "no-moving parts" trolley contact on the slidewire, which eliminates pigtails and their variable inductances. It includes use of a Mumetal slidewire shield where desirable, instead of less expensive but lower-permeability aluminum. And it includes a lot of just downright meticulous detailing, such as carefully engineered wiring and input filtering, plus ingenious shielding where required.

These and other precautions eliminate out-of-phase components in the supply to the amplifier. The latter therefore doesn't "load"; hence sends the correct amount of correct-phase power to the balancing motor. With ample power, the motor's recording and control action is snappy and accurate.

Our Catalog ND46(1) and Technical Publication ND46(1) tell the story. Write our nearest office or 4957 Stenton Avenue, Philadelphia 44, Pa.

Industry's engineers find that Speedomax instrument performance is not affected by the stray fields created by motors, electric furnaces, magnets, power lines and so on.

PHOTO COURTESY LACLEDE STEEL CO.

PHOTO COURTESY A CASTINGS MANUFACTURER

LEEDS NORTHRUP

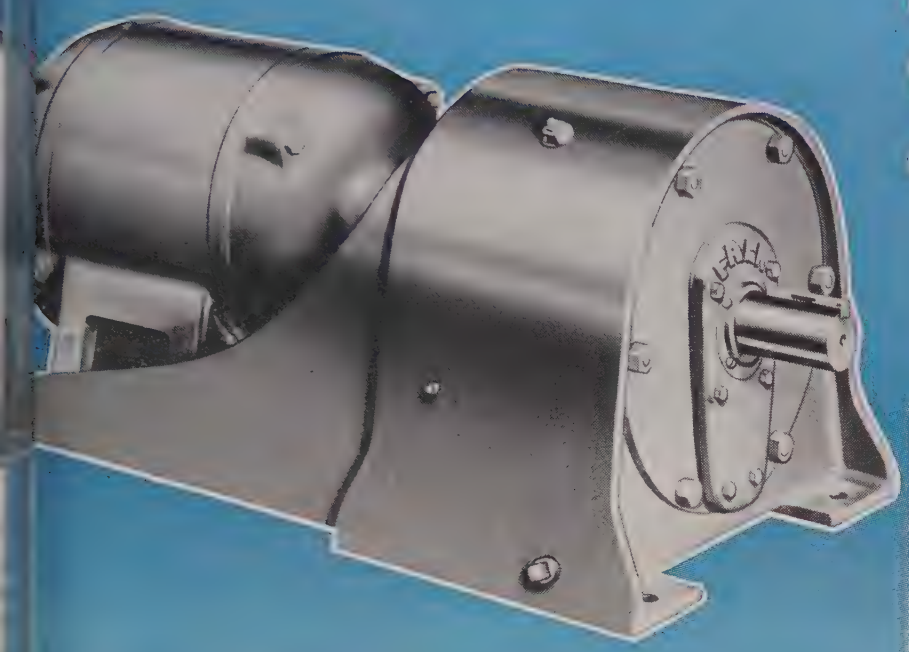
instruments *automatic controls • furnaces*

Ind Ad ND46 10

Choose the All-Motor type,

ALL-STEEL FALK Motoreducer

...with complete foot-mounted motor of ANY make ANY type ANY speed



Its exclusive, superior features mean LONG-RANGE ECONOMY!

You get more for your money in a FALK all-steel, All-Motor type Motoreducer. Here is the *only* compact motorized reducer with a separate foot-mounted, resilient Steelflex coupling-connected, standard motor without modifications! It accommodates *any* make, type, or speed of motor within the AGMA rating of the unit. Ratio can be changed within torque capacity of unit without modifying motor.

The simplified construction of the FALK All-Motor type Motoreducer means real long-range economy. Motors or reducer units can be quickly and easily interchanged from one line or plant location to another. Fully standard replacement motors from manufacturers' field stocks are always available without costly delivery delays or special motor or shaft modifications.

When you choose a FALK All-Motor type Motoreducer, you get the utmost in design, versatility of performance, and utility—plus the greatest possible dollar-for-dollar value throughout its traditionally long life... Available in any standard ratio from factory and distributor stocks throughout the country. Write for Bulletin 3104.

FALK ...a good name in industry

THE FALK CORPORATION 3001 W. Canal St. Milwaukee 8, Wis.

Every FALK motoreducer has these "IN-BUILT" FACTORS

1 **All-steel Housings.** Unbreakable, strong, rigid. Generous overhung load capacities provided by wide bearing spans, large shafts and bearings.

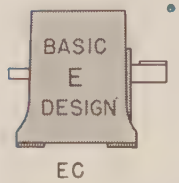
2 **Streamlined inside and outside.** Smooth, clean surfaces; machine welded construction conforms to NEMA motor frames.

3 **Sealed Housings.** Dual closures and one-way vents keep oil *in*, dust and moisture *out*. Units are splashproof, leakproof, dustproof.

4 **Positive Lubrication.** Large sump capacity ...oil-tight construction assures clean lubricant...direct dip of revolving elements provides positive lubrication at all speeds.

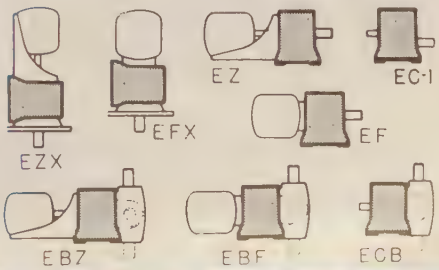
5 **Wide Speed Range.** Selective ratio combinations provide output speeds from 1.5 rpm to 1430 rpm with stock gears.

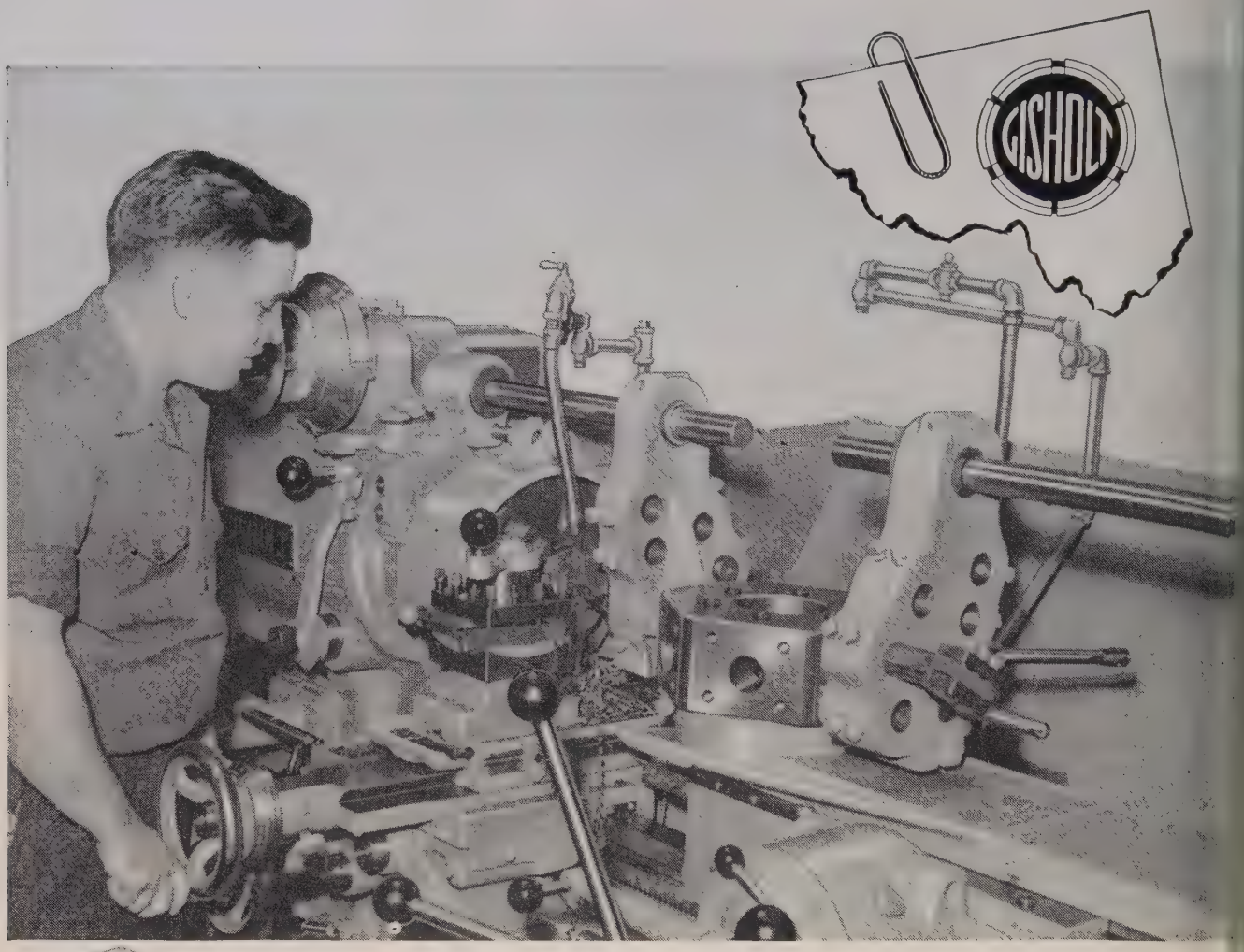
6 **Precision Gearing.** Heat-treated alloy steel, precision cut and shaved helical gearing throughout...quiet-operating crown shaved pinions...taper bored gears for easy ratio changes.

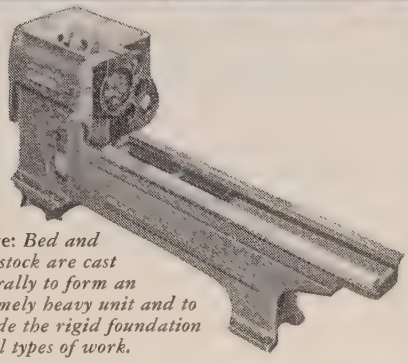


EC

The basic E design permits maximum use of standardized parts . . . closer control over materials, processing, inspection and assembly . . . resulting in faster delivery from interchangeable stocked assemblies.

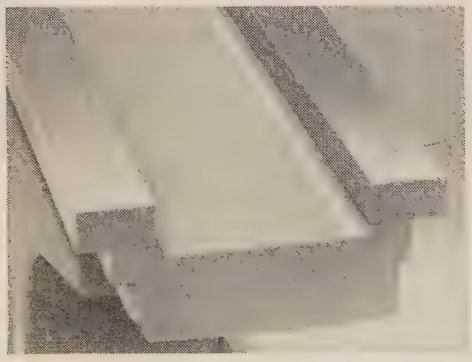






Above: *Bed and Headstock are cast integrally to form an extremely heavy unit and to provide the rigid foundation for all types of work.*

Below: *Block type ways are straddle keyed to the bed and ground in perfect alignment with the spindle. All working surfaces are hardened to 64-66 Rockwell "C".*



ACCURACY THAT DOESN'T "WEAR OFF"

Here are two good reasons why you can count on the accuracy of Gisholt Turret Lathes—now and years from now.

One-piece bed and headstock, cast as a heavy, rigid unit, reduce distortion and vibration to a minimum. Headstock is jig-bored to insure—and maintain—perfect alignment of spindle and drive shafts, with ample metal to provide the most solid support possible.

Hardened steel ways are a[u]mented by hardened steel strips [s]cured to the ram saddle, as well [a]hardened steel gibs and clam[ps] making an assembly that is virt[u]ally wear-proof. Its accuracy is t[o] ther preserved by force lubricati[on].

These advantages are yours [i]the long life of any Gisholt Tur[ret] Lathe. Ask for complete details.[ ]

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

For easier blanking or forming...depend on the uniformity of

WEIRTON

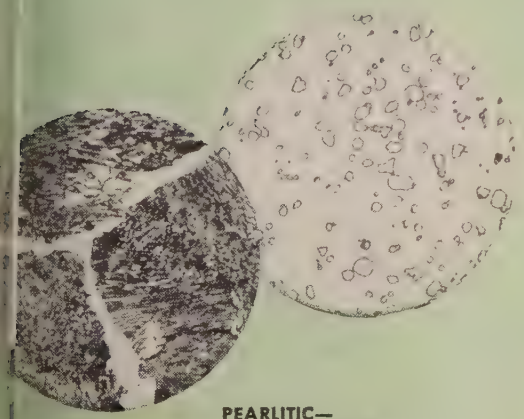
High-Carbon Strip Cold-Rolled Spring Steel

The requirements of high-speed cold forming or blanking are met consistently by Weirton cold-rolled spring steel. Formulated to exact specifications for each job, it makes the operation easy and economical for products in which high fatigue resistance is essential.

To an unusual degree, Weirton high-carbon strip cold-rolled spring steel possesses these highly important characteristics:

- **Uniform chemical and physical properties**
- **Exact consistency of grain structure**
- **Accurate response to heat treatment**
- **Exceptional uniformity of gauge and width**
- **Controlled decarburization limits**

It is supplied with the desired chemical composition and for specific heat treating and hardness ranges in strips up to seven inches wide.



SPHEROIDIZED—
Annealed, soft and ductile. Ideal for cold forming operations.

PEARLITIC—
Temper-rolled in controlled hardness and strength for blanking.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

ALUMINUM IS *Why* EVERY WHEEL ADDS FORTY POUNDS OF PAYLOA

In most states, the maximum weight of a trailer tractor and its load is fixed by law. So, in the trucking business, the object is to put the weight in the freight and not in the rig that hauls it.

Truckers do this by using a lot of aluminum in their tractors and trailers. Alcoa Aluminum Forged Disc Wheels combine the strength and durability of a forging with the lightness of aluminum. Weighing 30 to 50 pounds less than their steel counterparts, they can add 400, 700, perhaps 1,100 extra pounds of payload—depending on the number of wheels the rig has.

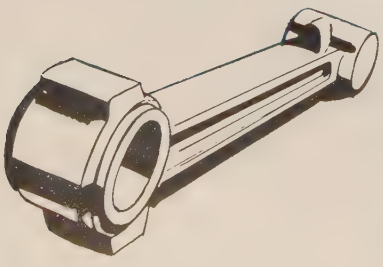
Alcoa Aluminum Forged Disc Wheels offer other important advantages besides weight savings. Tires run cooler because of aluminum's high-heat conductivity. Tires change easier because Alcoa Wheels are smooth and free from rust. Alcoa Wheels offer easier steering, longer tire life and smoother ride because they are precision forged and machined to run true.

Alcoa Aluminum

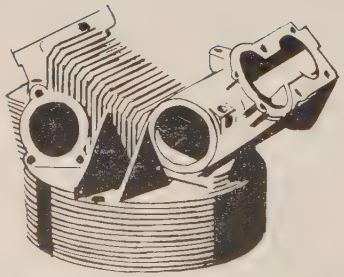
ALUMINUM COMPANY OF AMERICA

ALCOA IS *How*

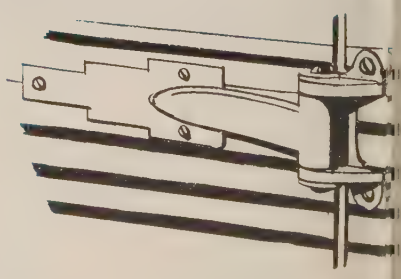
It was Alcoa who firs recognized the extra bonus of lightness that forg ings could give truck wheels. And it was Alco Engineers, who designed the first forged wheel. I Alcoa Research Laboratories, special testing ma chines were built to punish and study the wheel under every conceivable condition of service life Almost 50,000 Alcoa Forged Disc Wheels are givin extra payload to truckers all over the country . . many wheels have run over ½ million miles an are still going strong. Aluminum Company o America, 877-F Alcoa Building, Pittsburgh 19, P



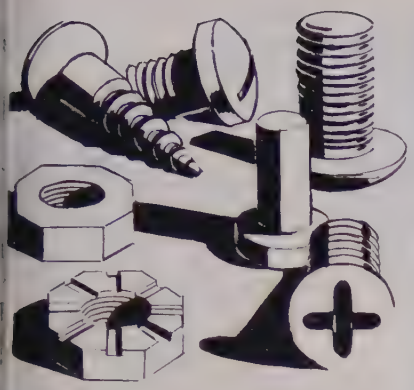
CONNECTING RODS for diesel engines, air compressors and outboard engines are forged of aluminum. They combine maximum strength with minimum weight and size.



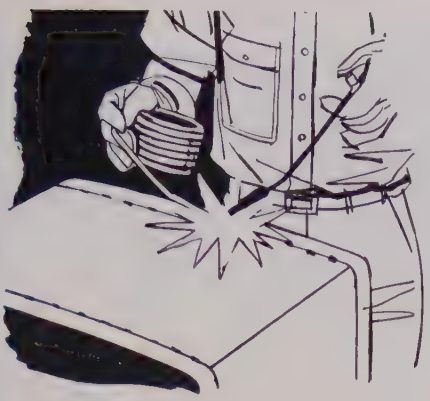
CYLINDER HEADS for aircraft have long been forged of aluminum by Alcoa. Aluminum heads increase power, reduce weight with no change in engine size.



FORGED HINGES and other heavy duty automotive hardware an forged of aluminum by Alcoa. Ex tra strong, extra light, corrosio resistant all the way through.

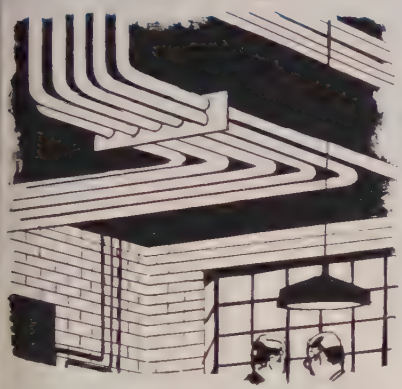


*FASTENERS of Aluminum are made by Alcoa in every commercial size and shape. A must with aluminum assemblies, they also dress up wood and plastic products.

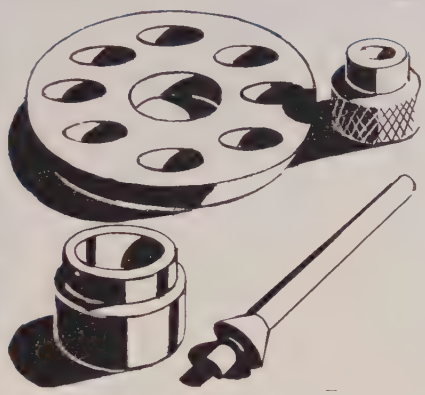


*FILLER METAL of Alcoa Aluminum is available in many alloys for use in brazing, torch welding and arc welding. It is also packed suitably for automatic welding operations.

Products marked* are available from your local Alcoa Distributor listed here

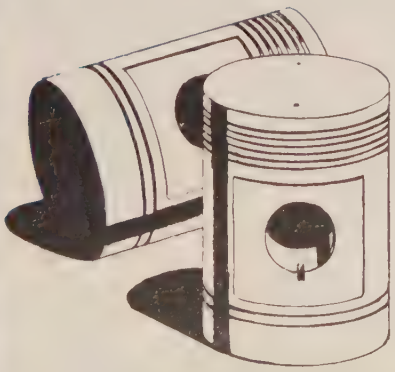


*RIGID CONDUIT of Alcoa Aluminum is the lowest cost corrosion resistant metallic conduit available. Its nonmagnetic properties improve electrical efficiency—its light weight speeds installation.



SCREW MACHINE PRODUCTS made of Alcoa Aluminum are light, lustrous and low cost. Alcoa's Edgewater, N. J. Plant is a screw machine job shop, turning out all types of fittings, special fasteners, etc., to customer specification.

*INDUSTRIAL BUILDING SHEET of Alcoa Aluminum is light and easy to install. It never requires painting or maintenance—costs far less than you would think.



GIANT PISTONS and bearings weighing up to 800 pounds are cast of aluminum in permanent molds at Alcoa foundries! Tolerances and surface finish are exceptional.

ALABAMA
Birmingham
Hinkle Supply Co.

CALIFORNIA
Los Angeles
Ducommun Metals & Supply Co.
Pacific Metals Co., Ltd.
San Francisco
Pacific Metals Co., Ltd.

COLORADO
Denver
Metal Goods Corp.

CONNECTICUT
Milford
Edgcomb Steel of New England, Inc.

FLORIDA
Hialeah
Florida Metals, Inc.
Jacksonville
Florida Metals, Inc.
Tampa
Florida Metals, Inc.

GEORGIA
Atlanta
J. M. Tull Metal & Supply Co., Inc.

ILLINOIS
Chicago
Central Steel & Wire Co.
Steel Sales Corp.

LOUISIANA
New Orleans
Metal Goods Corp.

MARYLAND
Baltimore
Whitehead Metal Products Co., Inc.

MASSACHUSETTS
Boston
Edgcomb Steel of New England, Inc.
Cambridge
Whitehead Metal Products Co., Inc.

MICHIGAN
Detroit
Central Steel & Wire Co.
Steel Sales Corp.

MINNESOTA
Minneapolis
Steel Sales Co. of Minn.

MISSOURI
Kansas City
Metal Goods Corp.
St. Louis
Metal Goods Corp.

NEW JERSEY
Harrison
Whitehead Metal Products Co., Inc.

NEW YORK
Buffalo
Brace-Mueller-Huntley, Inc.
Whitehead Metal Products Co., Inc.
New York
Whitehead Metal Products Co., Inc.
Rochester
Brace-Mueller-Huntley, Inc.
Syracuse
Brace-Mueller-Huntley, Inc.
Whitehead Metal Products Co., Inc.

NORTH CAROLINA
Charlotte
Edgcomb Steel Co.

OHIO
Cincinnati
Williams & Co., Inc.
Cleveland
Williams & Co., Inc.
Columbus
Williams & Co., Inc.
Toledo
Williams & Co., Inc.

OKLAHOMA
Tulsa
Metal Goods Corp.

OREGON
Portland
Pacific Metal Co.

PENNSYLVANIA
Philadelphia
Edgcomb Steel Co.
Whitehead Metal Products Co., Inc.
Pittsburgh
Williams & Co., Inc.

TEXAS
Dallas
Metal Goods Corp.
Houston
Metal Goods Corp.

UTAH
Salt Lake City
Pacific Metals Co., Ltd.

WASHINGTON
Seattle
Pacific Metal Co.

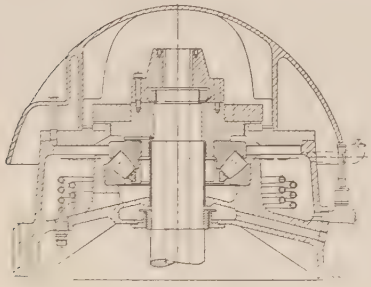
WISCONSIN
Milwaukee
Central Steel and Wire Co.
Steel Sales Corp.

Highest anti-friction capacity for VERTICAL SHAFT applications

The SKF Spherical Roller Thrust Bearing is becoming more and more popular as the means of supporting heavy thrust loads at high speeds. Vertical shaft applications demand bearing engineering which is abreast of the newest developments in equipment design.

Here is *why* the SKF Spherical Roller Thrust Bearing is earning increased application with manufacturers everywhere:

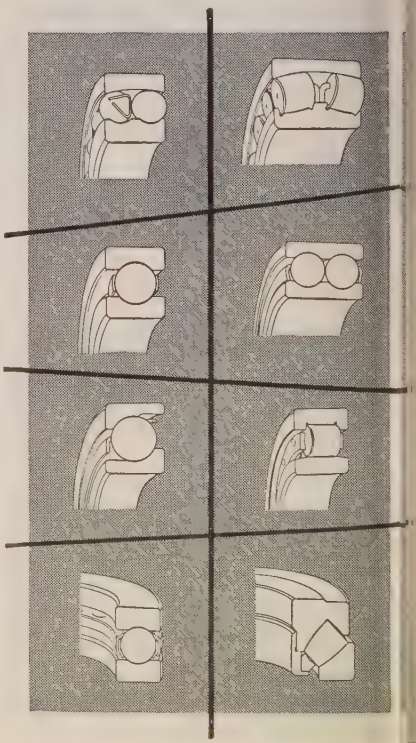
- The bearing has very high capacity for thrust loads, and combined loads which are predominantly thrust.
- It is fully self-aligning—has a single row of rollers which roll on a spherical outer race with full self-alignment.
- The bearing design is such that the lubricant is pumped outwardly against the inner ring high guide flange — thereby insuring perfect lubrication and long, trouble-free life.



The drawing shows a typical application of the SKF Spherical Roller Thrust Bearing—providing higher *capacity*, size for size, than any available design.

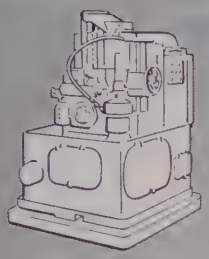
When you're laying-in anti-friction bearings, you can get design assistance and help from SKF Field or Home Office men who know the best ways to do the job in every industry. And, when you have a bearing replacement to make, call your SKF Distributor. 7435

SKF INDUSTRIES, INC., PHILA. 32, PA.,— *manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.*

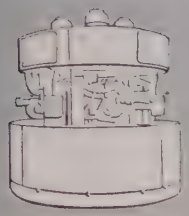


SKF'S COMPLETE LINE OF ANTI-FRICTION BEARINGS, PLUS **SKF** ENGINEERING CO-OPERATION, HELPS YOU *PUT THE RIGHT BEARING IN THE RIGHT PLACE.*

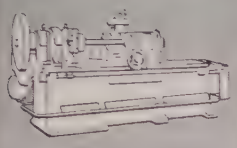
SKF®
BALL AND ROLLER BEARINGS



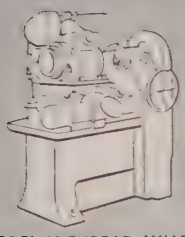
12-S HOBBER



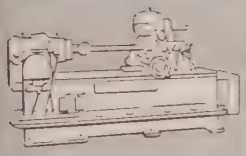
7-A ROTARY HOBBERS



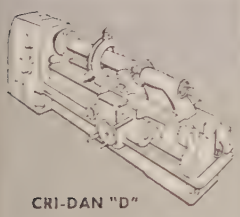
SH SPLINE HOBBER



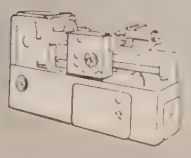
MODEL 40 THREAD MILLER



HT THREAD MILLER

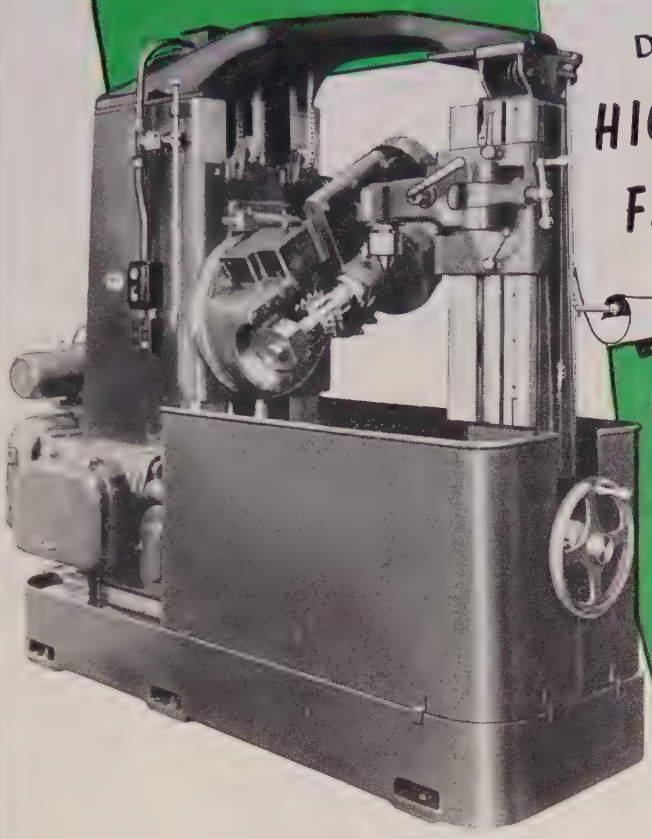


CRI-DAN "D"



CRI-DAN "B"

The Lees-Bradner Model "R" HEAVY-WEIGHT HOBBER



DESIGNED FOR

HIGHER SPEED FASTER FEED

SPECIFICATIONS

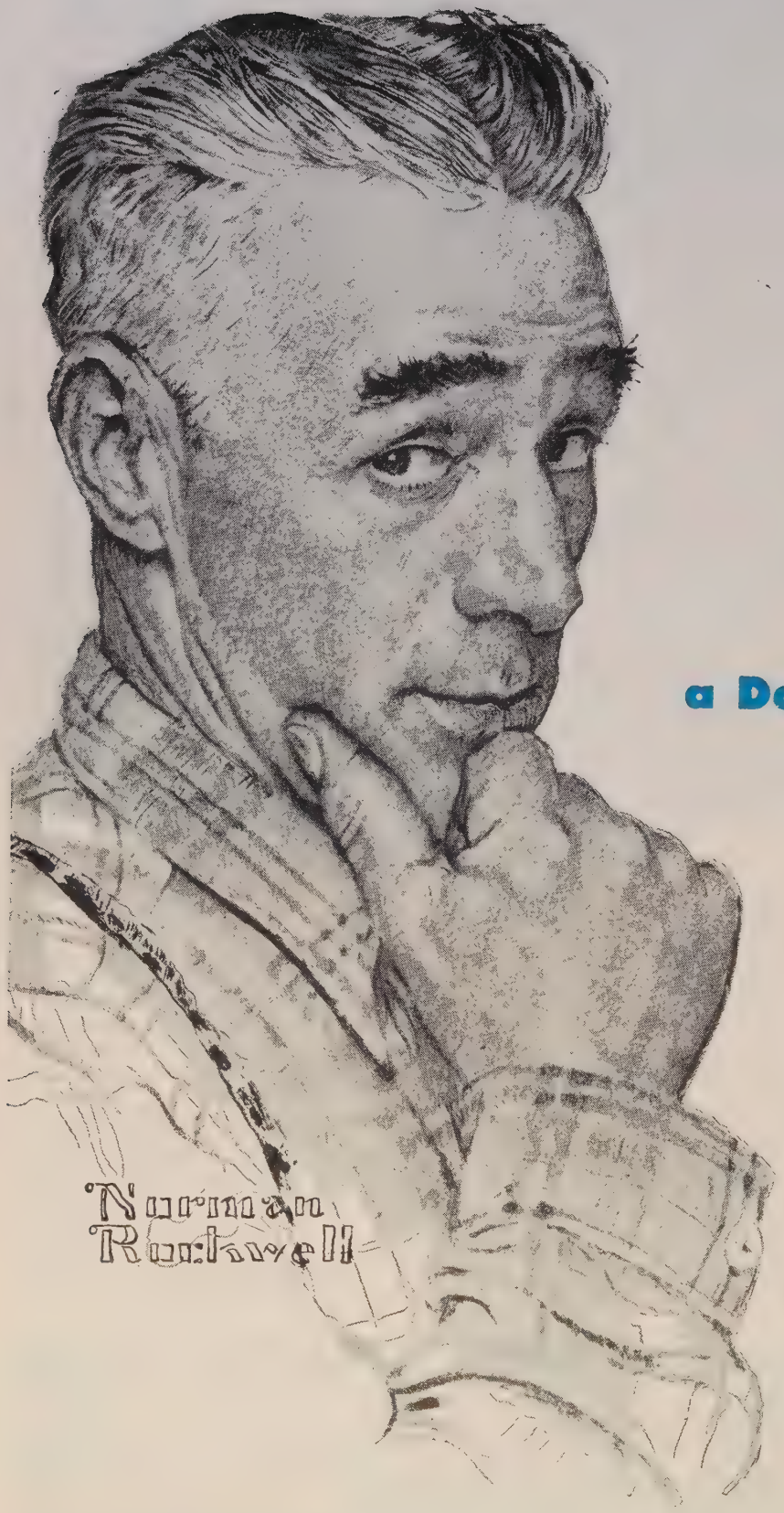
The true measure of the value of a machine tool is its productivity. And top day-in and day-out productivity can *only* be maintained if "down time" for maintenance is cut to a minimum.

The Lees-Bradner Model "R" hobbing machine was designed and built to perform at higher speeds with faster feeds and at longer intervals of time than any other machine of its type. It has a rated capacity far in excess of that required by the work that will normally be run on it. This additional "built in" capacity guarantees an extra margin of performance on long production runs.

So, if you have a hobbing operation where high, uninterrupted production is a "must", by all means investigate the Lees-Bradner Model "R" hobber. Call in our representative in your area or get in touch with us direct.

the LEES-BRADNER Company

CLEVELAND 11, OHIO, U.S.A.



You?...

a Doubting Thomas?

IF YOU'RE a man who has to be shown... we're right in your corner. Just gi... Roebling "Blue Center" Steel Wire Ro... one try... see for yourself how it save... time and costs you less on the job.

Two out of three wire rope users i... the industrial field prefer Roebling rop... Call the nearest Roebling office for... Field Man to suggest the best ropes fi... your purposes.

ROEBLING

A subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE TRENTON 2, N. J

Special Dracco Filter solved tough dust control problem at plastics plant. Rotary feeders on hoppers (shown here) discharge dust at pre-determined rate.

HOW DO YOU CONTROL COMBUSTIBLE CORROSIVE DUST?

●The Rohm and Haas Company, manufacturers of chemicals, plastics and resins, solved a serious problem of this type at its Bristol (Pennsylvania) plant by relying on Dracco techniques and equipment.

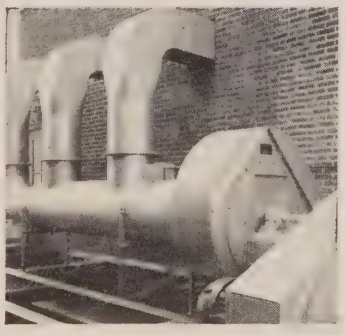
Dracco dust control engineers were called in to work with Rohm and Haas project engineers on the problem. This cooperative team supplied the "Performance Proved" answer for capturing combustible, corrosive acrylic resin dusts.

Dracco equipment specified for this application was a custom-designed Multi-Bag Filter with corrosion-resistant all-aluminum construction. Special features incorporated for protection against fires or explosions were: rupture plates with explosion vents leading to plant exterior, explosion-proof motors, static-proof V-belts and grounding strips woven into the cloth filter bags.

This dependable Dracco system operates continuously, recovering virtually 100% of the 325-mesh dust for re-use in the process. Both plant safety and operating efficiency have been improved as a direct result of this installation.

If your dust problem involves new or unusual materials, rely on Dracco engineers for the best in dust control.

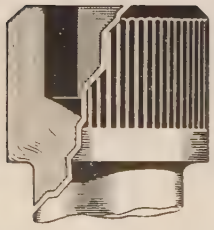
DRACCO CORPORATION
4080 East 116th Street • Cleveland 5, Ohio



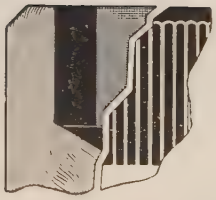
Exhaust manifold and Dracco fan assembly for Rohm and Haas installation.

DRACCO *Performance Proved*

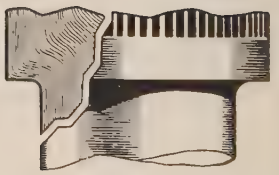
Airstream CONVEYORS • DUST CONTROL EQUIPMENT



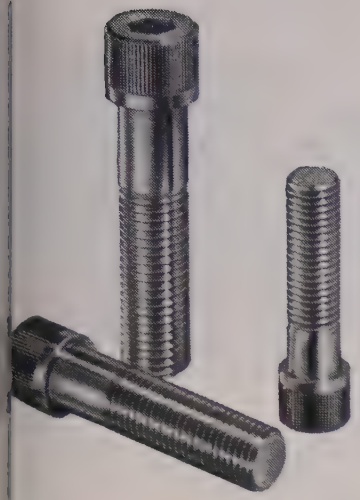
HEAD. Forged for maximum physical strength. Diameter and height are precision controlled—any deviation could be serious. Knurls, originated by SPS, provide easier handling and faster assembly by oily fingers.



SOCKET. Uniform depth and size assure strength and maximum torque in wrenching—extremely important in a socket cap screw.



FILLET. Completely formed to provide maximum resistance to shear and continuous grain flow throughout length of screw.



There's much more to an UNBRAKO than meets the eye

When you pick up a socket cap screw, you don't stop to examine it—it's so commonplace.

If you did, and it's an UNBRAKO, you'd marvel at the knurled head, the uniform hex socket, the smooth shank, the precision threads, all combined to make a strong, close tolerance fastener.

Quality control—from the selected alloy steels to the finished product—makes an UNBRAKO Socket Cap Screw what it is, the finest you can buy. Write for UNBRAKO Standards. SPS, Jenkintown 33, Pa.

UNBRAKO® SOCKET SCREW DIVISION

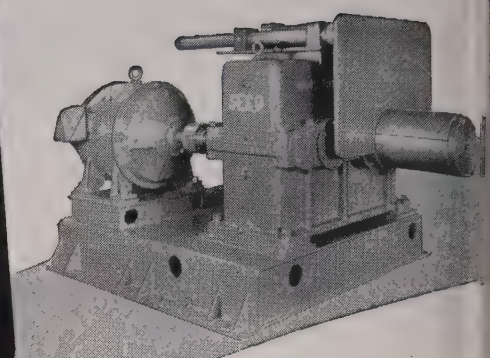
Stocked and sold by leading industrial distributors everywhere

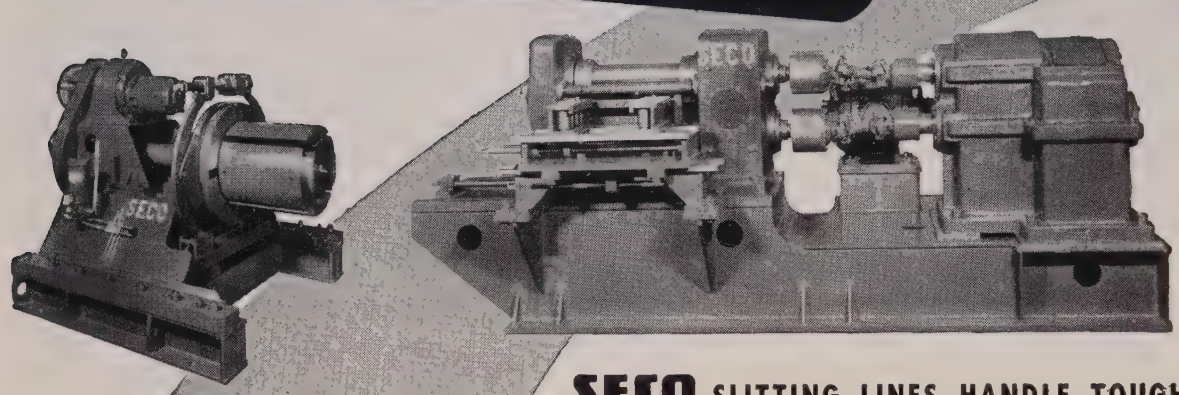
SPS
JENKINTOWN PENNSYLVANIA

THREADS. Fully formed to maintain continuous grain flow and prevent shearing. Made to Class 3 fit. Controlled fillet at root of threads gives added tensile and fatigue strength.

UNBRAKO Standards—as listed in the SPS Catalog—are stocked by leading industrial distributors everywhere.

YOU CAN SLIT 1/4" STEEL LIKE PAPER!



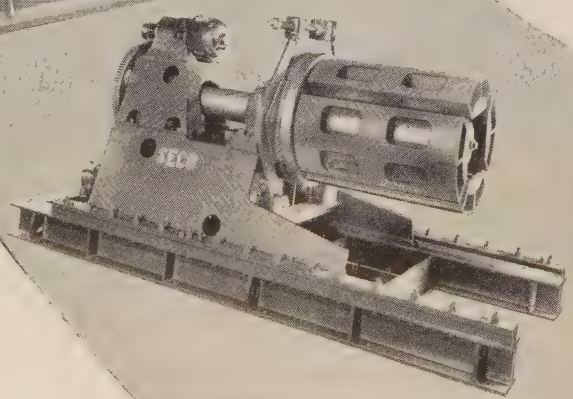


SECO SLITTING LINES HANDLE TOUGH JOBS — GIVE FAST, PROFITABLE PRODUCTION ON HEAVY STOCK

It takes plenty of rugged strength to slit 1/4" steel. But powerful, efficient SECO Slitting Lines can handle this tough job easily and quickly. Production is fast and profitable, with a minimum of down time.

Exceptional quality and accuracy are built into every piece of SECO equipment, large or small. The latest design and engineering features are included — to give you highest efficiency and years of trouble-free service.

Check with SECO today on your slitting requirements. Our engineers will be glad to talk over your problems with you—and there's no obligation on your part. Write for full information.



STEEL EQUIPMENT CO.

Designers and Builders of Steel Mill Equipment

P.O. BOX 737, WARRENSVILLE STATION
CLEVELAND 22, OHIO

● Shown above are two heavy-duty SECO Slitting Lines capable of slitting steel up to 1/4" thick. The payoff reel, slitter and recoiler in the top three photos handle up to 20" width stock. The bottom three photos show a line of simplified design for slitting strip up to 42" wide. Both lines will handle up to 20,000 pound coils.

SECO

3-way analysis FROM 3 ANGLES...

to gain 3 benefits...

● Republic's Three-Dimension Metallurgical Service begins with an examination of your production problem by one of our field metallurgists. Along with the mill and laboratory metallurgists, he makes a diagnosis. These three then pool their knowledge of alloy steels, heat-treatment and machining . . . and come up with a prescription that's suitable . . . efficient . . . and keeps within or below your cost limits. The result? Higher quality . . . greater output . . . and economy. If you can use these advantages, call in Republic:

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
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Republic REPUBLIC STEEL
ALLOY STEELS

Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

For rebuilding or repairing coke oven

you can count on Koppers

● Koppers has designed and erected a great many coke-oven plants similar to the one shown here. In fact, the constructing of new coke ovens represents a major part of our services to the Iron and Steel Industry.

However, what may not be as well-known are the services we are bringing to bear on the coke-oven repair and rebuilding projects that are now assuming increasing importance in the programing of many companies.

For such projects, we extend to you the same scope of engineering skills and experience, the same meticulous adherence to the client's best interests, the same ability to engineer economies and superior performance into the finished job that have characterized our work on new construction.

Whatever your needs in coke-oven repair or rebuilding as well as for new construction . . . we will look forward to the opportunity of discussing your problems with you.

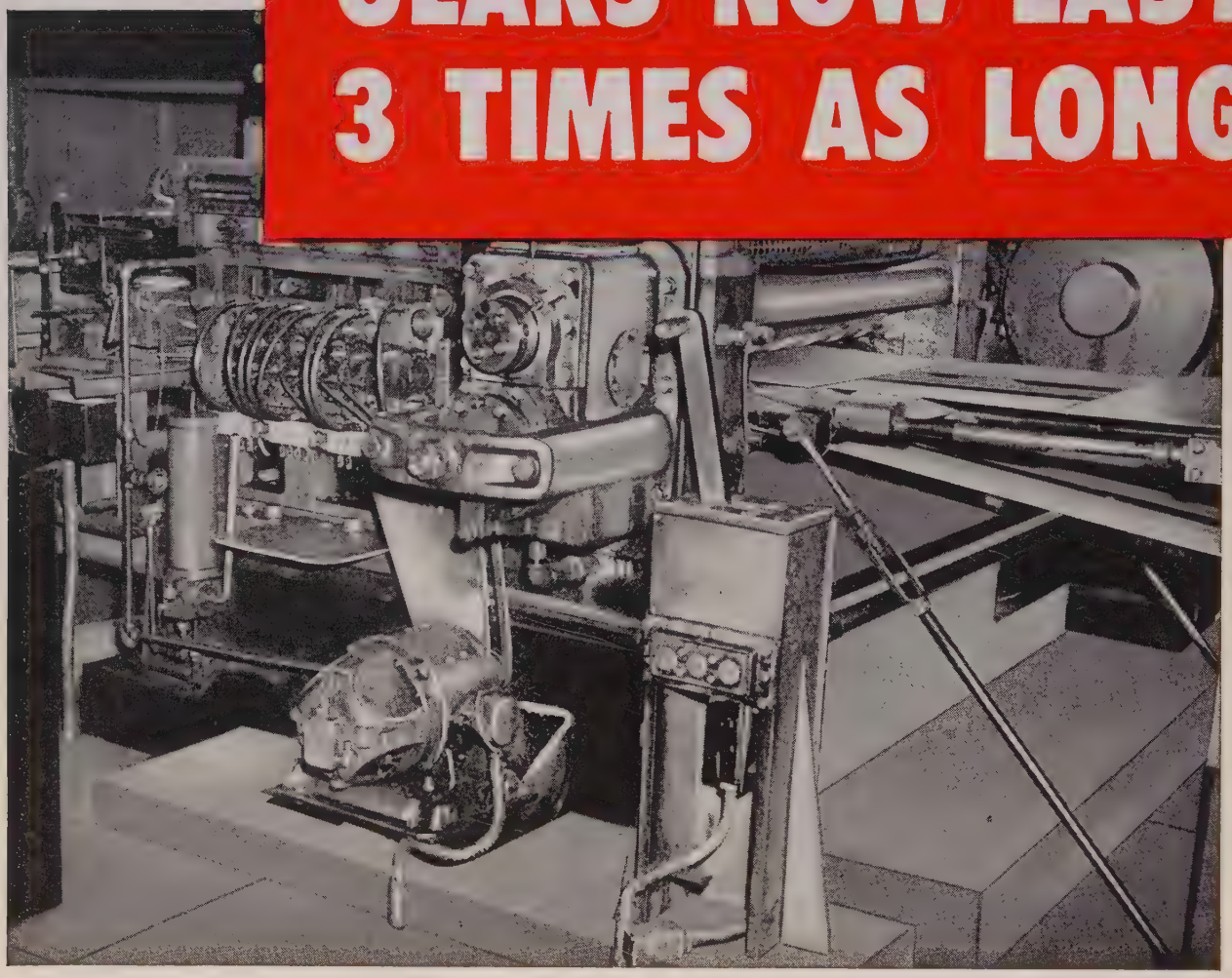
Constructing, rebuilding or repairing coke ovens is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, you can count on Koppers.

KOPPERS

Engineering and Construction Division

KOPPERS COMPANY, INC. • PITTSBURGH 19, PA.

WEIRTON'S SHEAR GEARS NOW LAST 3 TIMES AS LONG



The Situation: Weirton Steel Company, Weirton, W. Va., was having trouble with the gears of seven Hallden tin plate shears. Gears were pitting badly and running so hot that a continuous vapor rose from the vent. Gear life was only about five months.
The Remedy: A Texaco Lubrication Engineer was called in, asked to study the problem. He recommended *Texaco Meropa Lubricant* and the lubricant on one shear drive was changed over as a test.

The Results: Improvement in performance with *Texaco Meropa Lubricant* was so marked that within six months the other six shears were also changed over. The average life of the gears is now eighteen months.

Wierton's experience typifies the ideal protection *Texaco Meropa Lubricant* affords enclosed gears of every type. The EP properties of *Texaco Meropa Lubricant* are especially long-lasting and are not affected by high operating temperatures. *Texaco Meropa Lubricant* does n[ot] separate, thicken or foam. It is n[ot] affected by moisture. It is highly [re]sistant to oxidation and non-corrosi[ve] to bearings.

Let a Texaco Lubrication Engine[er] give you all the facts. Just call t[he] nearest of the more than 2,000 Texa[co] Distributing Plants in the 48 State[s] or write:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

The Metalworking Outlook

June 15, 1953

Capital Outlay Prospects High

American industry this year will spend more than $27 billion as a record outlay for new plant and equipment (p. 53). "The rate," says Machinery & Allied Products Institute, "looks somewhat higher than we can regard . . . as indefinitely sustainable." Yet MAPI does point out that good rates, somewhat lower but still high compared with prewar experiences, are possible for the next decade. Replacement requirements have been rapidly rising in recent years. If they continue to grow 3 per cent per year, replacement needs alone will amount to $23 billion by 1963.

New Press for the Air Force?

The Air Force is dickering for a new giant press to be used in its heavy press program. Up until now the units that the Air Force has seriously considered have had capacities up to 75,000 tons. Nobody knows what limits the latest press will have, but its designers—Austin Co., Cleveland, and Hydraulic Press Mfg. Co., Mt. Gilead, O.—claim an upper capacity of at least 200,000 tons. If the deal is consummated, Austin and HPM through their jointly owned Throatless Press Co. would build the unit, called the Throatless Press, for the Air Force.

Expansion in the Delaware Valley

New industries are still moving into the booming Delaware river valley. The first wave of newcomers attracted by U.S. Steel Corp.'s Fairless Works is picking up even more momentum than it had six months or a year ago. Industrial leaders see the peak of area growth resulting directly from the Fairless Works as being another year away.

Titanium: Not Enough

Manufacturers of titanium products will soon be asked to reschedule their deliveries to military contractors. Production directives may be necessary to assure the delivery of critical items on time. Shortages of raw titanium are accounting for the current lag in deliveries. Production of the sponge material will reach only 3400 tons in 1953 but is expected to rise to about 18,600 tons annually by 1956. Melting capacity now is above the current output of sponge titanium.

Too Much Competition Here

Look for the armed services to get out of manufacturing operations which compete with private companies. Congress has brought pressure to bear on the Defense department. First result of the pressure is the Navy's promise to confine its paint factories at Mare Island, Calif., and Norfolk, Va., to the production of special compositions. Being investigated are two Air Force installations of furnaces to process aluminum scrap.

Help to Industry

Two important Congressional measures that industry favors have a good chance of eventual acceptance. One is S. J. Res. 3 to amend

Production-Engineering News—p. 89 The Market Outlook—p. 141

the Constitution to prevent the President from seizing private property "other than in a manner prescribed by act of Congress." The other is S. 24 which would protect contractors by permitting them to seek relief in the courts against arbitrary and unfair rulings of government procurement officers.

Taxes and Mergers

Keep a keen eye on tax angles if you're considering purchasing another company or some of its assets. Westinghouse Air Brake Co., Wilmerding, Pa., did that in buying assets of R. G. LeTourneau Inc., Peoria, Ill. Business Reports Inc. says Westinghouse Air Brake paid more than book value and will get more than half its cost back out of depreciation in the next ten years. Of the $26 million it paid, $6.5 million is turnover money paid for inventory. The remainder will give Westinghouse Air Brake a depreciation return on assets which stood at only $4.3 million on the LeTourneau books.

Rising Premiums for Engineers

Is your company in step with increasing salaries for engineers? A survey by the National Society of Professional Engineers reveals that half of the engineers replying earned more than $8350 in 1952. Some 25 per cent earned more than $11,500 and 75 per cent received over $6640. Fully 90 per cent earned above $5620 last year. Since Korea, average beginning salaries for engineers have risen to around $330 per month.

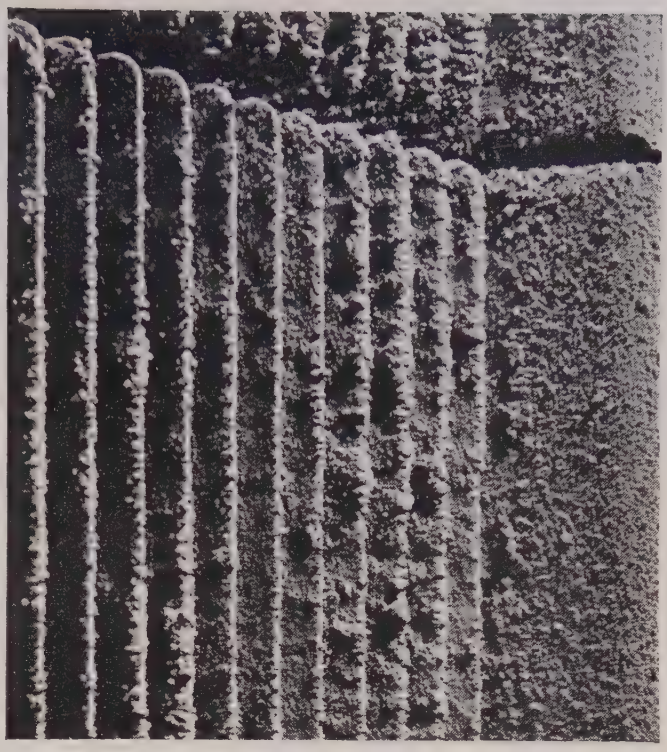
Straws in the Wind

General Electric is reducing prices of vibration indicators and recording vibrometers from 16 to 39 per cent . . . B. F. Goodrich Co. says now is the time for government-owned rubber producing facilities to be sold to private industry . . . Wage increases may occur on another front when CIO's United Rubber Workers ask three of the industry's four big companies for "substantial" general wage increases, pension and insurance benefits next week . . . Plymouth is boosting production of cars with a new no-shift drive combination, Hy-Drive, and retail deliveries are now being made.

This Week in Metalworking

Wage increases thus far this year are averaging about 7 cents, compared with 11.75 cents in 1952 (p. 49) . . . Reznor Mfg. Co. finds its wage incentive program is spurring workers to higher individual output (p. 50) . . . Experts in materials handling get down to cases with industrymen in the first traveling clinic of the Material Handling Institute (p. 51) . . . Sales of fractional horsepower motors may rise 25 per cent this year to $230 million (p. 52) . . . Electroplaters are waging a successful battle against the nickel shortage through use of alternate processes and lighter strikes of nickel (p. 54) . . . The Senate will probably concur with the watering down of the Economic Controls Bill by the House of Representatives (p. 55).

Before—PRECIPITRON® cells in close-up show clean aluminum collector plates. This is the way they appear after periodic washings, which dispose of all trapped airborne particles.



After only 2½ weeks cleaning "normal atmospheric" air, the same plates had accumulated this much dirt. PRECIPITRON stops airborne dirt, pollen, mists—even germs and smoke!

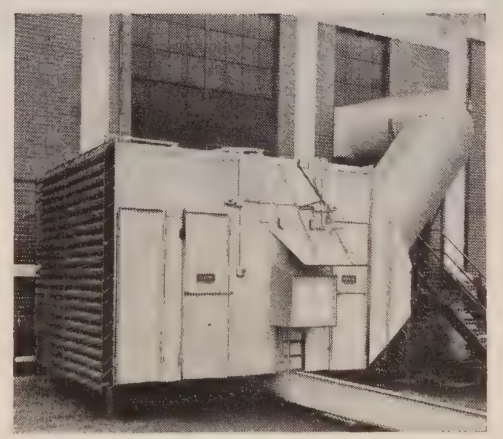
ELECTRONIC BARRIER

AGAINST INVISIBLE DIRT

Air that's "fit to breathe" *isn't* clean enough for many plant operations. Particles of invisible, airborne dust on motor windings cause overheating, fire or electrical failure. Minute corrosion specks can mar the finished surfaces of finely machined parts. In many of your operations, plants, offices—even your own home—"invisible" dirt costs you money.

But PRECIPITRON—the electronic air cleaner—will take *all* the dirt out of the air. It removes particles so tiny they can be seen only with an Ultra Microscope. The savings in controlling airborne dirt with PRECIPITRON are worth looking into today.

To help you *put air to work*—with air cleaning, air conditioning or air handling—Westinghouse offers a complete equipment line. For a free copy of General Catalog 600, call your local Westinghouse-Sturtevant Office. Or, write to Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, Boston 36, Mass.



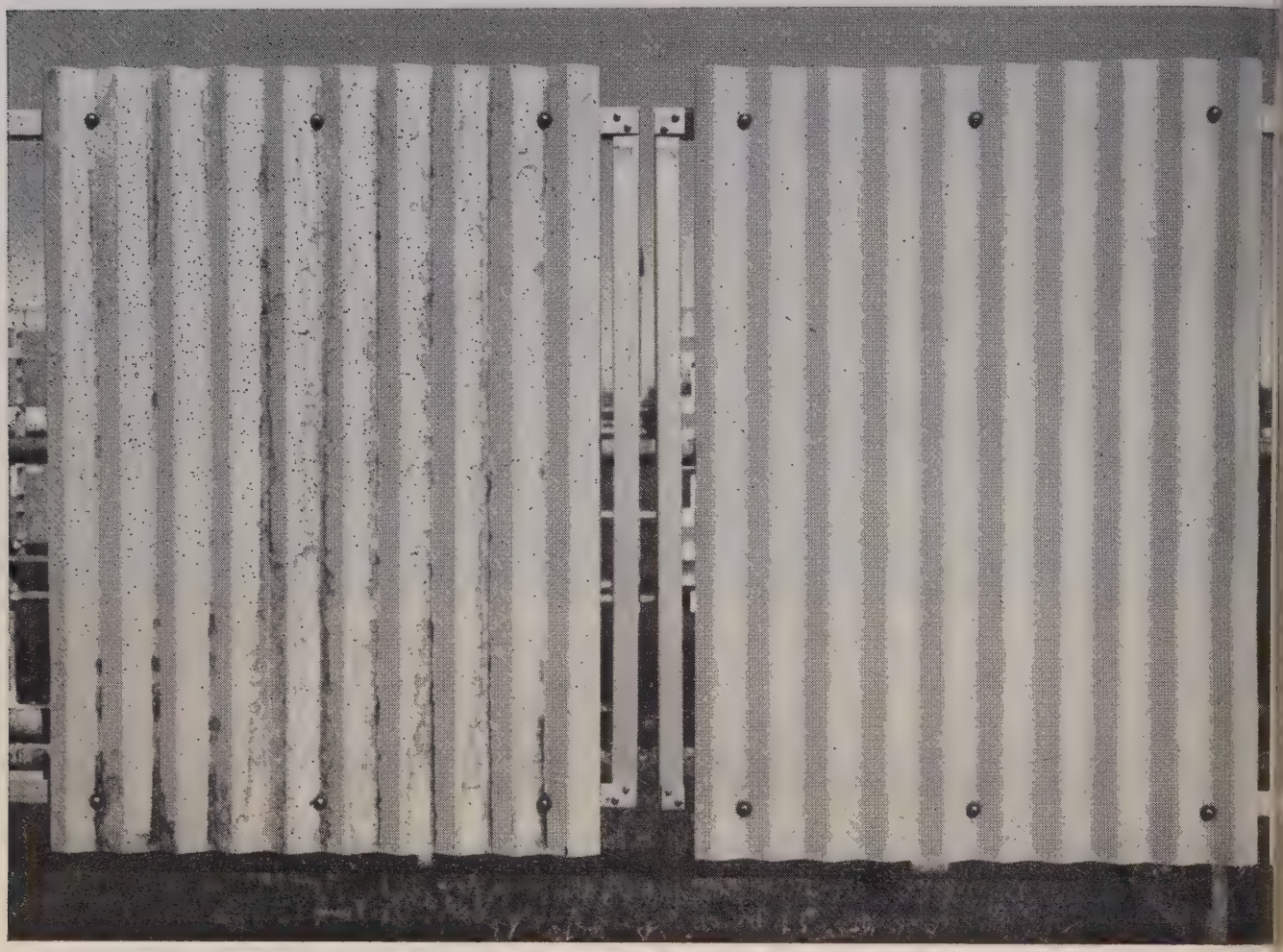
Cleaning efficiency of PRECIPITRON is 90% or better at 333 fpm. Dirt is held on the plates until washed down. A garden-type hose flushes it directly into the drain—quickly, easily, inexpensively.

YOU CAN BE SURE...IF IT'S **Westinghouse**

AIR CLEANING

J-80227B

After two years' exposure in a corrosion-test yard, this is how two painted samples looked. The corrugated 28" x 36" sample at the left is regular untreated galvanized steel. Note how the paint has flaked and peeled away from the zinc coating over parts of the entire panel. Sample at the right is Armco ZINCGRIP PAINTGRIP. Here the paint is just as smooth and beautiful as the day it was put on. No cracking or flaking of the paint occurred.



Special zinc-coated steel DOUBLES PAINT LIFE

Tests show paint life on special zinc-coated Armco ZINCGRIP PAINTGRIP sheets is at least *several times longer* than on regular galvanized surfaces or uncoated steel.

The reason is a mill applied Bonderized finish on top of the zinc coating. This finish takes paint immediately and helps preserve it. No acid etching or surface treating of any kind is needed.

With ZINCGRIP PAINTGRIP you give your painted products and equipment these profit-and-sales advantages: *Lower finishing costs, longer lasting and more attractive products, and more satisfied customers.*

Besides assuring longer paint life, Armco ZINCGRIP PAINTGRIP provides unbroken zinc protection for sharp curved sections as well as flat parts. Blanks can be formed or drawn without flaking or peeling of the special zinc coating. This coating takes as severe a draw as the base metal.

Maybe you can profit from this double-edged sales mover and shop saver. Armco ZINCGRIP PAINTGRIP has a record of more than twelve years in proved service. It was the *first* hot-dip zinc coated sheet and strip steel that could be severely formed and drawn and painted immediately without pre-treatment.

ARMCO STEEL CORPORATION

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A Lesson for Us

Last Thursday the National Assembly of France rejected Georges Bidault as premier by one vote. He was the fifth man asked by President Vincent Auriol to form a government to replace Rene Mayer, whose regime was voted out on May 21. The present failure of the people's representatives to agree upon the choice of a premier constitutes the nineteenth political crisis in the nation since the end of World War II.

Why does France find it so difficult to establish and support a stable government? One answer lies in the peculiar political situation that exists in the country. Another has its roots in the decadence of the nation's economic system. Perhaps no person who is in a position to know the ills of France has described them as accurately as did 74-year-old, ex-premier Paul Reynaud.

Two weeks ago he pointed out to the National Assembly that the franc has lost nine-tenths of its value since the war, that France is one of the few nations in which the standard of living has not improved since the Korean war began and that industrial production in France lags far behind that of other nations.

In answer to the question as to why France fares so poorly in industrial production, Mr. Reynaud replied: "Because we are a country where many people want to keep the profits of the capitalistic system without respecting its laws, of which the first one is free competition. These people allow neither external nor internal competition. Agreements result in the fixing of sales prices according to the production costs of the most backward enterprises."

These significant words of the ex-premier point out clearly the danger of the capitalistic system when free competition is restrained or destroyed. They come very close to describing the situation that would have developed in the United States if our National Recovery Act of the thirties had not been declared unconstitutional by the Supreme Court.

Our capitalistic system in the United States is strong because it is competitive instead of monopolistic. The present plight of France shows clearly why we should keep it that way.

E. C. Shaner

EDITOR-IN-CHIEF

HONEST DEALING PAYS: In this issue are two articles dealing with incentive plans. One is a case study (p. 50) showing how wage incentives in a western Pennsylvania plant have proved beneficial. The second is a guide (pp. 59-61) to pitfalls that may be encountered when instituting an incentive program.

From both articles it is obvious that the suc-

cess of an incentive plan rests upon an absolutely fair method of compensation. This has always been true. More than forty years ago there was a shop in which there were four gangs of about 100 machinists and helpers each—all on piecework. A special apprentice, who had taken a terrific beating from foremen of the old school, suddenly was placed in charge of one of these gangs.

He bought a cheap note book. Whenever he assigned a crew to a dirty job where the piecework rate was too low, he noted it in the book. Whenever he assigned a crew to a "gravy" job, it was likewise recorded. No crew was assigned to a dirty job or to a gravy job a second time until every crew had had a taste of dirt or gravy.

After a few months, the kid's gang was outproducing the other three. Its members were earning about 8 per cent more. Today, as then, fair dealing is the most effective incentive.

* * *

LIMITED LEGISLATION: As of now, leaders of the Eisenhower administration are inclined to limit severely the legislation that they expect Congress to pass before summer vacation. The "must" items (p. 56) have been reduced to these: Legislation on submerged lands in the outer continental shelf, simplification of custom laws, appropriations, extension of Reciprocal Trade Agreements Act, Pakistan wheat loan, admission of 240,000 iron curtain refugees, tax laws, foreign aid, government reorganization and extension of the Defense Production Act.

Important among the delayed actions are amendments to the Taft-Hartley Act, decision upon the statehood of Hawaii and Alaska, revision of Old Age Insurance and participation of the United States in the St. Lawrence waterway project.

* * *

STEEL'S UPS AND DOWNS: In the June issue of *Steel Facts*, published by the American Iron & Steel Institute, appears a chart showing the monthly production of steel ingots from 1907 through April, 1953. During this period of 556 months, over 2.4 billion net tons of steel were produced. About 25 years—from 1907 to 1932—were required to turn out the first billion tons. The last billion tons were produced in less than 12 years—from late in 1941 to Apr. 30, 1953.

Another way to trace the advance in steel output is to note the dates when production first passed certain million-ton milestones. The first five-million-ton month was March, 1926; the first six-million-ton month, October, 1939; first seven-million-ton month, March, 1941; eight-million, January, 1949; nine-million, March, 1951, and 10-million, March, 1953.

Output fell below a million net tons a month in several months of the depression year of 1932 and in two months in 1949, due to a general strike.

* * *

INVEST MORE IN PLANT: For a long time each report of the Department of Commerce and the Securities & Exchange Commission on projected capital expenditures of American business has been so encouraging that many observers have been expecting a sharp reversal. It was freely predicted that the last half of 1953 would witness a marked retrenchment in investment.

The latest joint report of these government agencies (p. 53) states that American businessmen expect to spend $27 billion in 1953 on new plant and equipment compared with $26.5 billion in 1952 and $20.6 billion in 1950. This offsets to a considerable extent the earlier predictions. Leaders in sustained heavy investment are petroleum, chemicals, machinery and fabricated metals.

* * *

ASSIST ATOMIC POWER: Announcement was made by Gordon Dean, chairman of the Atomic Energy Commission, that AEC scientists have developed an atomic furnace which replaces uranium at a rate equal to its consumption of uranium 235 while changing nonfissionable uranium into plutonium. This "breeding" process means that as much or more atomic material can be created as is burned up in manufacture.

A possible outcome of this development (p. 55) is that private industry may participate in atomic work to a greater degree and at an earlier date than previously had been expected. Henry D. Smyth, a member of AEC, says present government monopoly on atomic power should be reconsidered. "We have to balance the reasons for making atomic explosions under government monopoly against the many advantages of turning over to competitive industry at least the industrial power aspect of atomic energy."

the 3rd. DIMENSION

May be the difference Between PROFIT and LOSS

Here's how *MicroRold*® Stainless Steel Saves You Money

The third dimension, or gauge thickness, is extremely important in the purchase and use of stainless steel. Job costs are figured on a square foot of stainless area basis while stainless sheets are purchased on a weight basis. Each one-thousandth inch saved in thickness saves 1.26 pounds per sheet.*

When sheets are ordered by gauge number, the permissible A.I.S.I. variation in thickness is plus or minus 10%. Thus, if you order 18 gauge you may receive sheets .052″ thick, when a thickness of .0475″ would suit your purpose. Using a standard 18 gauge 36″ x 120″ sheet as an example, the theoretical weight is 63.00 pounds, but this weight could permissibly vary between 59.22 pounds and 65.52 pounds.

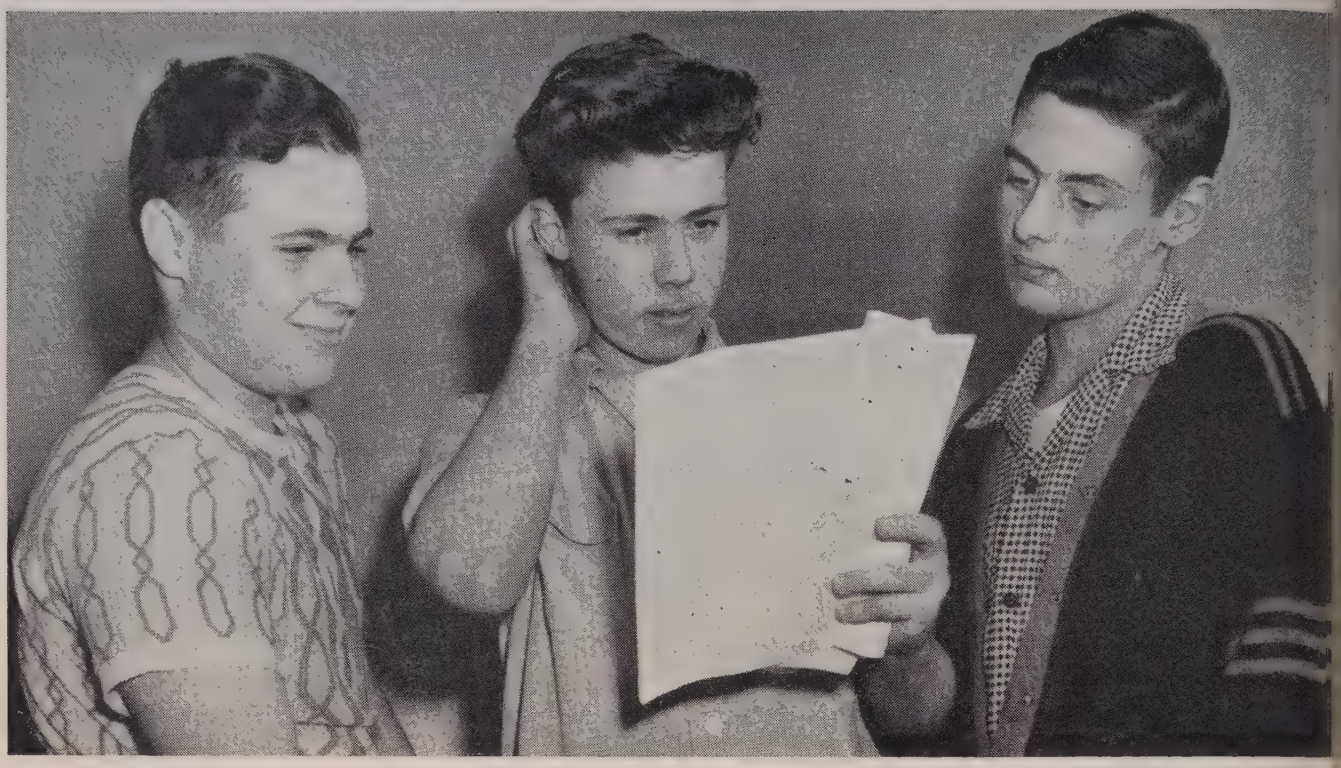
MicroRold sheets may be ordered by gauge number and you may specify they be rolled on the light side of the gauge range. This is true because the company's equipment is such that more accurate control of thickness is possible.

If you are not a user of MicroRold sheet it will pay you to get the full details. Your steel warehouse distributor will gladly tell you the MicroRold story.

**36″ x 120″ standard size sheet.*

WASHINGTON STEEL CORPORATION

Washington, Pennsylvania



Smart steel buyers of 1968!

Ryerson joins in the Junior Achievement Program

These boys, still in their teens, are part of a group that's already operating a successful company! They are members of Junior Achievement, Inc., a nation-wide organization whose objective is to help young people learn about American business and industry *by doing*—young America on the way up!

Under the guidance of business executives who recognize the vital importance of encouraging the spirit of enterprise in America, Junior Achievement members decide on a product—and then go to work. With the counsel of key people from interested firms like Ryerson, they organize a company, elect officers, set up books, raise money by selling stock at fifty cents a share, buy raw materials and begin production.

Right from the start they learn that they are in business to render a service and to make a profit. And they discover that, with rent and wages to pay, this isn't always easy—that it takes ingenuity and hard work. In short, they're learning how to do business the American way.

Junior Achievement companies pay dividends, too—an average of five cents on every fifty cent investment.

But we think that the real dividends will be paid in the future—when these boys and girls—getting their feet wet in the adventure of free enterprise—will carry on the principles that have made America strong—and will keep it strong.

Joining with many of the nation's leading firms, Ryerson is proud to play a small part in Junior Achievement. And we look forward to working with its graduates in future years.

PRINCIPAL PRODUCTS IN STOCK

CARBON STEEL BARS—Hot rolled and cold finished

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

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JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
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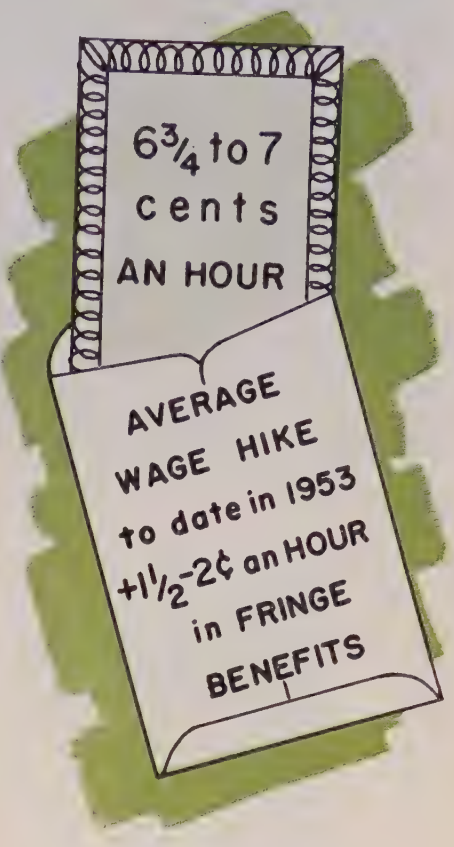
Management Gets Tougher; Labor Gains Less in 1953

The average 7-cent increase thus far this year compares with 11.75 cents granted in 1952 and 7.48 cents in 1951. Fringe concessions are lower this year, too



MPLOYERS are getting tougher bout wage and fringe concessions o labor.

The average straight wage increase of about 7 cents an hour hus far granted this year (see the ccompanying illustration) compares with a weighted average of 1.75 cents granted in 1952 and .48 cents in 1951. Fringe benefit osts obligated in 1953 also promise to be lower than those added n the previous years. Figures are ompiled by Associated Industries f Cleveland from negotiation results in the Cleveland area. Labor xperts consider the figures as ndicative of the national average.

Influence—The effect of the auto settlement on other negotiations s already being felt, and steel wage gains will be, too. The auto agreements probably will influence he national averages toward lower levels, rather than higher. The money concessions made by General Motors, Ford and Chrysler are not great. Although autoworkers this June are making 6 cents an hour more than they were earning last June, 4 cents of that would have been due under the old agreements. So, the net gain is about 2 cents an hour, plus about 1 cent an hour in added costs to the companies because of higher pensions.

In aircraft, pay settlements have been for 6 to 10.5 cents; 8 to 25 cents in construction; 13 cents in shipbuilding; 2 to 8 cents in electrical products and 5 to 12 cents in machinery.

Fringes—Concessions on fringe issues are much less in 1953 than in other postwar years. The reasons: Unions mined the fringe-issue seam nearly to exhaustion during the wage stabilization period, and many contracts, including that of the steelworkers, prohibit opening on any issue other than straight wages at this time. That provision rarely stops a union from trying to drag in fringe matters, but it certainly slows the labor chiefs down.

Major fringe matters being conceded this year include a third week of vacation for employees with 15 or more years of service; payment for a holiday regardless of whether it falls on Saturday or Sunday and increased insurance payments. Although 1953 fringe gains for labor are not great, the cost to employers is still rising and now probably averages 33-35 cents per payroll hour, compared with 31.5 cents in 1951. Fringe payments for 138 companies surveyed by the U.S. Chamber of Commerce rose from 14.8 per cent of payroll in 1947 to 16.8 per cent in 1949 and 18.9 per cent in 1951. They amount to an estimated 20 per cent now.

Even Tougher — Prospects for the rest of the year are for even lower wage and fringe increases. A truce in Korea would support that trend, but the major reason for the lower boosts is that industry can no longer afford higher costs in an economy becoming more competitive every month.

Furthermore, to counterbalance the gains yielded to labor, employers are insisting with more and more success on some concessions from labor. Most of those involve union agreement to tighter standards for a fair day's work.

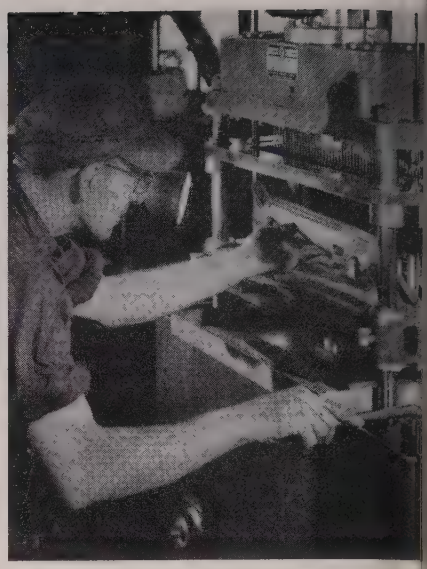
Steel Jobs Hit New Peak

Employment in the steel industry reached a new high total in April with an estimated 685,000 persons, an increase of 1900 persons over the previous month and 100 persons over the previous record month of February, says American Iron & Steel Institute.

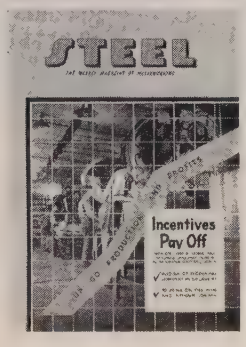
Total payroll of the industry in April was over $278 million, down $3 million from the previous month. In the first four months of 1953, employees were paid more than $1.1 billion, or $151 million higher than in the same period a year earlier and almost as much as in the first six months of 1950 and more than in the entire year of 1940.

Wage earners averaged $2.203 per hour in April, compared with $2.206 in March and $1.938 in April, 1952. Wage earners worked an average of 41 hours each week in April, as against a 40.3 hour work-week in March.

Reznor management talks over the Rucker plan . . .



No production delay here . . .



Incentives Pay Off at Reznor

Rucker plan spurs workers at Pennsylvania plant. Result: Wastage and absenteeism drop as employees' morale and individual effort climb

GREATER OUTPUT per worker, almost no absenteeism and better labor relations—that's the record achieved by a Mercer, Pa., heating equipment manufacturer after instituting new wage incentives for its 200 hourly-rated workers. (For another report on wage incentives, see p. 59.)

In 1948, management at Reznor Mfg. Co. began to ask questions about its utilization of labor. The company suspected it wasn't getting what it paid for. Some workers "killed time" after their specific jobs were finished in midafternoon. Others waited for trucks to be unloaded so they could begin work.

Project Started—"Our first step was to investigate the new wage incentive plan offered by Eddy-Rucker-Nickels Co., management consultant of Cambridge, Mass.," Vice President William Schodlatz says. "We began the program in May, 1949, following Rucker's engineering of the plan to our operations—the first gun in a double-barreled program to use our workforce more efficiently and install 'management - consciousness' in each man. Now, four years later, the same men who waited for trucks to be unloaded pitch in and help unload them.

"The Rucker Share of Production Plan guarantees a fixed percentage of 'production value' as compensation for employees," Mr. Schodlatz continues. "Production value represents the sales value of our output, minus amounts paid to other companies for materials and supplies.

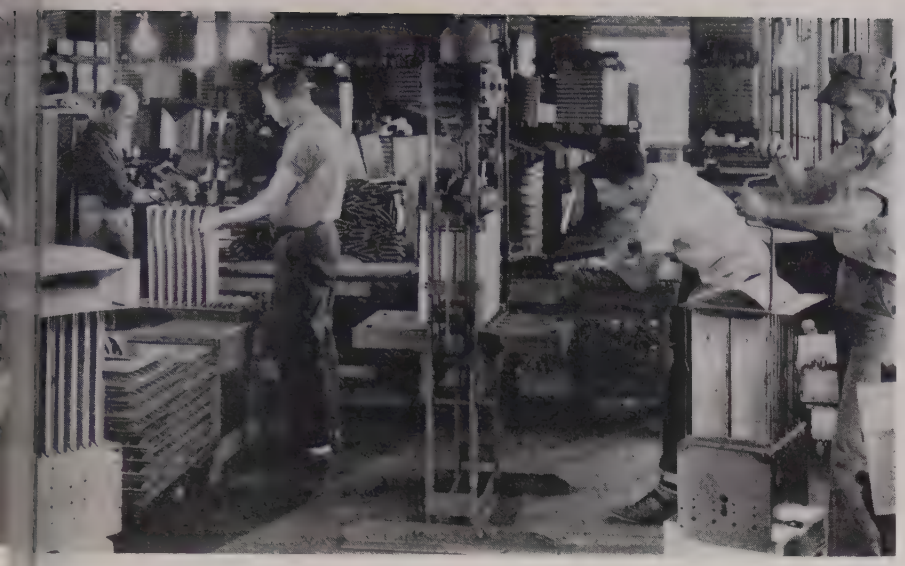
"The plan makes labor a partner of management in raising production values by: 1. Reduction in material wastage and scrap; 2. improvement of quality and reduction of rejects and customer returns, and 3. by increased output. The larger the production value, the greater labor's pay."

Production Value—Management at Reznor benefits as much as labor from the Rucker plan. The raise in employee earnings comes from increased production value relative to the regular payroll. Even after paying employees increased wages amounting to from 18 per cent to 43 per cent of their regular pay, company profit relative to sales has jumped 16 per cent since 1948.

"Workers are more careful — they don't leave lights burning in an empty room—they don't have as many accidents as before," Mr. Schodlatz reports.

Response—At first, Reznor workers were lukewarm to the plan. "We had to sell them on its advantages," Mr. Schodlatz remarks. "Only after workers realized how they could boost their own pay by efficient workmanship did they become enthusiastic about it. Now we have teamwork at Reznor."

While engineering their plan to Reznor operations, officials of Eddy-Rucker-Nickels found that factory labor costs historically equalled 20 per cent of production value, regardless of the ups and downs of business volume. Under the Rucker plan, when production values are raised through greater efficiency in all respects named above, without a proportionate increase in regular payroll costs, labor's share of 20 per cent automatically results in extra earnings



Incentives lead to skilled workmanship . . .

Earnings Increase — Additional pay is distributed each month, the employees receiving a prorated amount according to their individual earnings (including overtime pay). One-fourth of the men's monthly added pay is carried to a reserve account and distributed at year end, prorated on the actual earnings of each person.

In March, 1953, production value at Reznor reached $286,992. Labor was credited with its share, 20 per cent, or $57,398. This increasing production value was obtained without a corresponding rise in regular payroll, which was $37,420. Labor received the difference between its credit and its regular pay, in amount of $19,978.

Productivity Pay — As understanding and acceptance of the plan grows among Reznor workers, the proportion of "productivity earnings" to regular pay also grows. In 1950, added earnings amounted to 18 per cent of regular pay. In 1952, productivity earnings were 39 per cent of regular pay, and in the first three months of 1953, the figure stood at 43 per cent. These increases are made possible by material savings, improved quality, fewer rejects and returns and improved efficiency.

As a result, "productivity earnings" form a sizable proporation of the Reznor worker's income. In 1952, for instance, the average hourly regular pay was $1.50. Share of production added an average of 57½ cents an hour, to total $2.075. This amount, plus fringe benefits (pensions and insurance) included in the Rucker plan and a small discretionary factory bonus not included in the plan, raised the average hourly earnings last year to $2.67.

More Incentive—In earlier years, a worker could miss several days of work each month and still earn the same hourly rate of pay. Now, since an absent worker gets no added earnings, there is a real incentive to stay on the job.

Relations Improve—David Webster, Reznor president, believes the Rucker plan has had many specific advantages for his company, including better labor relations. Once a month, management meets with a committee of six plant workers and one foreman. Reznor officials present financial figures for the month, showing sales value of output, cost of materials and supplies and production value.

Labor's share of 20 per cent of production value is shown, together with the regular payroll (including overtime and all fringes) as a means of computing the total earnings.

Stating the Facts — "We show why earnings are larger or smaller," Mr. Schodlatz says. "If carelessness is raising our costs, we say so. After the steel strike ended last year, we needed real co-operation from the men to build up production again and they responded perfectly. Since our workers have a stake in how this company operates, we get immediate results. And so do they!"

Clinic Gets Down to Cases

Materials handling experts go to industry to talk shop, answer specific questions

WHAT'S the maximum economical distance for shipping palletized goods? How can you be sure of getting the most warehousing capacity in the smallest space? Should I buy or rent industrial trucks?

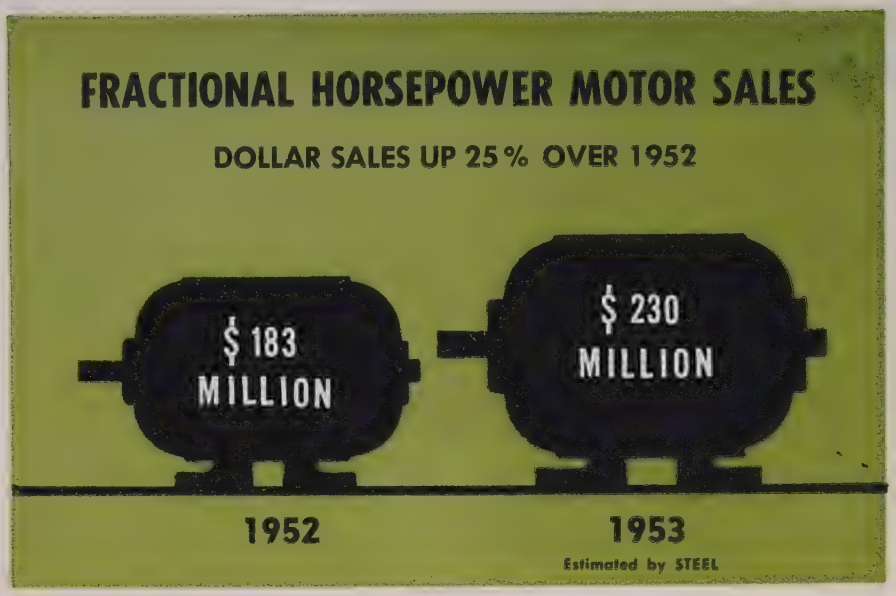
These and similar questions confronted five panels of materials handling experts at the first traveling clinic of the Material Handling Institute in New York last week, held in conjunction with the New York-New Jersey chapters of the American Material Handling Society.

Informal, Informative—Program keynote was "Getting Down to Cases" and that's just what the sessions did. Industry's operating personnel talked shop with panel members who represented policy-making levels of equipment manufacturers.

One example of the practical tips traded during the sessions: R. H. Graves, United States Metals Refining Co., New York, told how his company solved the age-old problem of handling lengthy products such as tube, bar stock and roofing sheet in bundles. At one time eight men needed a whole day to unload a box car of corrugated sheet by hand. By accident a car of the sheet was spotted one day where two men with a fork truck were working. They unloaded the car in an hour and ten minutes by lifting the end of the bundle with the truck's fork, slipping a dolly under the middle and towing the bundle out.

Spotlight on Europe at Fair

European and British machine tool exhibits drew keen attention from American and Canadian visitors at the Canadian International Trade Fair, Toronto, which ended June 12. Canada led the exhibit in both visitors and exhibits with England and West Germany following closely. U. S. exhibitors used the fourth largest amount of space. Actual sales at the fair ran to several hundred thousands of dollars.



Motor Market: Strong but How Long?

MANUFACTURERS of fractional horsepower electric motors are going to have a better sales year in 1953 than in 1952. The only question is: How much better?

Figures from the National Electrical Manufacturers Association indicate the gain may be as much as 30 per cent for the first half. Total sales for the 34 companies in the field accounting for the bulk of fractional motor output were $57.5 million in the first quarter of 1953 compared to $44.3 million in the first quarter a year ago. Preliminary second quarter figures show percentage gains nearly as high as in the first quarter.

Diminishing Problem—Materials no longer are the critical deterrent they once were. Copper is less difficult to get than silicon sheet steel which itself is generally adequate to meet current needs.

Though materials supply presents a lessening problem to fractional motor makers, materials prices are increasingly troublesome. D. L. Mills, manager of A. O. Smith Corp.'s motor division in Dayton, O., says: "Our price increase of 3 per cent effective June 15 doesn't nearly cover the 9 per cent increase in materials costs during the last year, most of which occurred in the last 6 months."

Unstable Balance — The present balance between high costs and low prices in fractional motors is precarious. Motor manufacturers need a price increase but are unsure of what the market will bear. How appliance producers, who take from 80 to 90 per cent of the standard fractional motor output, will fare economically is the big question.

Appliancemakers have had a busy first half, but within the last month ordering has slowed down and in some cases cut back. Forward ordering which was stretching to six months up until April has now been brought back to three months. The fractional motormaker wonders whether the lull in appliance ordering is temporary, indicative of a seasonal slowdown for vacation periods, or whether the lull will set the tempo for the second half.

Solid Markets—Other than appliance demand, markets are holding up well. Defense work has shown little decline from a year ago, but accounts for only about 10 per cent of standard fractional motor production. Small dc motors for automobiles are going well; E. R. Godfrey, General Motors vice president in charge of the Dayton and Household Appliance Group, says GM's Delco Products Division plant in Rochester, N. Y., produced 600,000 such motors in May alone. Aircraft small motors, another specialized type, have never been produced faster.

Despite a recurring pessimistic note about the second half, appliance and automobile makers seem intent on pushing production ahead undiminished. That prompts one fractional motor producer t[o] say: "A 30 per cent increase i[n] sales probably won't materializ[e] but a 25 per cent increase is no[t] too much to hope for."

Electricity: New Peak Seen

Electricity production in th[e] next six to ten years may surg[e] forward in its greatest outburs[t] of growth, taking over many en[-] ergy jobs now done by gas an[d] oil, says George A. Lamb, man[-] ager of business surveys, Pitts[-] burgh Consolidated Coal Co., Pitts[-] burgh.

The U.S. merely has to exten[d] the rate of growth of the past six years for this to occur by 1958 and it certainly will take plac[e] within the next ten years, Mr. Lamb emphasized. Market de[-] mand between 1946 and 1952 ros[e] 100 per cent for natural gas, 7[1] per cent for oil and 72 per cent fo[r] electricity. This rate of growt[h] would require by 1958 a supply o[f] 16 trillion cubic feet of gas, 4.[4] billion barrels of crude oil and 80[0] billion kilowatt-hours of electricity.

Such an upsurge in deman[d] would force radical changes in th[e] use of basic fuels. Proved reserve[s] of natural gas, which increase[d] only 25 per cent when consump[-] tion doubled, won't be sufficient t[o] meet demand. As the need for c[oal] mounts toward the 4.5-billion-ba[r]rel point, the pinch on supply an[d] higher replacement costs will pe[r]mit electricity to make wider i[n]roads into that market.

Superior Opens New Plant

Superior Steel Corp. is startin[g] operations at a $7.7 million go[v]ernment-owned plant at Carneg[ie] Pa., to produce gilding-metal cla[d] steel strip used in jackets for bu[l]lets. The new plant, operated und[er] a contract with the Army Ordnan[ce] Corps, will raise Superior's cla[d] metal capacity to about 80,000 n[et] tons annually from 30,000 ton[s]. The government has first call [on] the plant's production, but Superi[or] may lease facilities not needed f[or] government jobs to produce co[m]mercial items.

Superior is using at the plant [the] basic clad metal process, develop[ed] by the firm in 1939, in which st[eel] is clad with either gilding met[al] or cupro-nickel.

General Metals Corp.

NEW PLANT AND EQUIPMENT EXPENDITURES

(Millions of dollars)

	Nine Mos. 1952	Nine Mos. 1953	Per cent change
ALL INDUSTRIES	19,193	20,479	+7
Manufacturing	8626	9226	+7
Durable-goods industries	4130	4291	+4
Nondurable-goods industries	4497	4934	+10
Mining	651	649	0
Railroads	1035	1051	+2
Transportation other than rail	1030	1007	−2
Public utilities	2696	3325	+23
Commercial and other	5155	5221	+1

Sources: Securities & Exchange Commission and Department of Commerce

Capital Outlays Gain Steadily

Industry faces civilian production with renewed energy for expansion. Rate of gain may level off late this year, but no slump looms ahead

THE AMERICAN economy's buoyant rise should continue uninterrupted through 1953, a survey of capital outlays by the Commerce Department and Securities & Exchange Commission indicates.

"American businessmen plan to spend a record $27 billion in 1953 on new plant and equipment, compared with $26.5 billion in 1952 and $20.6 billion in 1950," a previous report forecast, (STEEL, Mar. 30, p. 35). Even that optimistic forecast may be too low, despite the possibility of a Korean truce.

Point to Prosperity—If present programs materialize, capital outlays for all industry will total $20.5 billion for the first nine months of this year as the chart on this page shows. Continuance of investment at that high rate would boost capital outlay above $27 billion this year.

These signs show no reversal of the trend toward increasing capital investment, although the rate of climb may taper off. Earlier predictions of a slump in the second half of this year are now being revised as most industry groups are scheduling third quarter outlays at or above first half rates.

Uptrend—Leading the advance are such industries as petroleum, chemicals, machinery and fabricated metals. Primary nonferrous metals plan expenditures of $140 million on new plant and equipment in the third quarter, compared with $129 million in the first quarter and $144 million in the second quarter. Fabricated metal products anticipate investment of $104 million in the third quarter, compared with $94 million in each of the first quarters.

Healthy expansion in electrical machinery and equipment will push investment from $105 million in the second quarter to $121 million in the third. In machinery other than electrical, expenditures rose from $198 million in the first three months of 1953 to $251 million in the second quarter, before dropping to an estimated $229 million in the third quarter. Transportation and related equipment showed a slow but steady rise from quarter to quarter.

Still Gaining—On a seasonally-adjusted basis, scheduled outlays show annual rates of $28.4 billion in 1953's second quarter and $28.7 billion in the third quarter, compared with a rate of $27.2 billion in the first quarter.

While stocks faltered when a Korean truce first appeared probable, industry has the self-confidence to increase investments for civilian production. Like many industrialists, J. P. Stewart, president of De Laval Steam Turbine Co., Trenton, N. J., welcomes the fact that "we're back in a buyer's market and will have to sell our wares." Will a truce hurt business? Speaking for all capital goods producers, Mr. Stewart exclaims, "God help us if we have to depend on Koreas to keep going!"

Industry Modernizes — Noticed by several observers is the trend toward greater expenditures for modernization of plants and equipment than for expansion. Industry, having poured tremendous sums into plant expansion during war years, is now devoting a steadily-high capital outlay to keeping its facilities up-to-date.

Expansion Goals Changed

The Office of Defense Mobilization is raising the ceilings on four expansion goals. The revised goals provide for additions to equipment and enlargements of existing plants only and are to be completed by Jan. 1, 1954.

The expansion goal for machine tools is raised $7.6 million to $138.6 million of capital investment in added production capacity.

The revised goal for miscellaneous metalworking equipment (welding equipment, machine tool attachments and accessories, industrial heating equipment, gages and precision measuring instruments, rolling mill and wire drawing equipment, and foundry equipment and supplies) is increased $6.7 million to $46.7 million in new capacity.

The goal for metal cutting tools was increased $2.5 million to $32.5 million in private outlays on new production facilities.

The revised expansion goal for facilities to produce dies, jigs and fixtures is set at $38.1 million, or $5.1 million over the previous goal.

United Platers

Despite shortages, more brightwork comes from the tanks as . . .

Platers Continue Search for Substitutes

Despite the nickel shortage, platers have increased their business—largely through use of alternate plating processes and lighter strikes of the scarce metal

THERE'S A MYSTERY in electroplating: How do platers continue to increase business volume in the face of critical shortages of materials, especially nickel?

If Sherlock Holmes were to tackle the case, he would find: 1. Platers will probably top last year's volume of business in 1953; 2. they aren't getting enough nickel. Several things account for this paradox.

Ersatz—The main reason is substitutes. Although no single method or material has replaced nickel, the cumulative effect is considerable. The substitute plating method most used—especially by appliancemakers—is chrome over a heavy strike of copper, either direct or with a bare minimum of nickel. Chief advantage is that a minimum of equipment change is required, and as nickel becomes more available it can be worked into the process easily and economically.

Automakers, who own the largest captive shops in the industry, are putting a clear lacquer or enamel over finishes containing less nickel than formerly. It's expensive and difficult to do, but it protects the chrome against rust with a little more than normal care.

Encouraging—Ford Motor Co.'s experiments with white brass (80 per cent zinc and 20 per cent copper) have proved so promising that an installation is underway at Monroe, Mich., to explore further the potential of the finish.

The British Iron & Steel Research Association says that a coating of 5 per cent zinc and 95 per cent ferroalloy has good corrosion resistance, good porosity, good appearance and a high rate of deposition.

The high rate of production in the motor capital, according to Ray Ledford, sales manager of Industrial Filter Pump & Mfg. Co., Chicago, is maintained considerably by secondary metals. But the only thing that can really help the nickel platers is an increase in nickel allocations.

The Real Reason—Many platers have been forced to inferior quality in order to stretch their supplies of plating materials. The government is largely responsible for that. Last September, National Production Authority, in an effort to help the industry, permitted a nickel strike of 0.00005 inch on articles previously not allowed. Raymond M. Shock, executive secretary of the National Association of Metal Finishers Inc., Washington, says that is unsatisfactory. Platers would like to set their own limits for each job and have the responsibility of conserving their own allotments.

But the regulations limiting the maximum nickel strike are proving impractical to enforce. Also of concern to the government and to plating shops is the gray market in nickel. Indications are that a few operators are not using all their allocations and are selling the metal at four or five times its market price.

Industry's Gripe—At present, the industry, which numbers about 4000 members, gets 25 per cent of base period requirements of nickel, not counting military and AEC needs. The stainless steel industry gets 115 per cent. Mr. Shock thinks the relationship is unrealistic and something should be done about it. So does Al Korbelak, editor of *Plating*, publication of the American Electroplaters' Society. He points out that Australian platers get 60 per cent of base period, and in England it's 50 per cent. He thinks American platers should get more of a fair share of available nickel.

And yet, things look good for platers this year. Hanson-Van Winkle-Munning Co., Matawan, N. J., reports that sales of equipment and supplies are running 10 to 15 per cent ahead of last year. But Inspector Holmes would almost assuredly come up with the first report that the only real solution is elementary: More nickel.

Business Services Planned

A proposed Commerce department agency will serve industry in continuing such functions of the National Production Authority as allocation related to defense. The agency will establish industry divisions with advisers recommended by various industries to represent them.

Sinclair Weeks, secretary of commerce, reports that the organization will be co-ordinated with regular agencies of the department to give the government top-level business counsel. Each segment of industry will have its special division for receiving government information and service.

ontrols Controversy

Senate is expected to concur with revised provisions of watered-down controls act

SENATE bill to continue controls of the Defense Production Act received a working-over by the House of Representatives, and the Senate is now expected to concur with the representatives' changes. Designated as the Economic Controls Bill, it provides for a one-year extension of allocation, priorities, production, expansion and procurement provisions of the earlier act.

Significantly, the House threw out a 90-day standby wage, price and rent freeze voted by the Senate.

Aid for Defense — The House-passed bill includes financial and material assistance to defense industries. In a House amendment to the Senate bill, national defense is defined as "the operation and activities of the armed forces, or operations and activities of any government departments which the defense department certifies as concerned with the national defense, or operations in connection with the Mutual Defense Assistance Pact of 1949." This is a narrower definition than that contained in the Senate bill.

This House amendment would destroy the Office of Defense Mobilization plan to secure authority to extend aid to civilian expansion of industry generally. As the bill now stands, government assistance could be obtained only for civilian industry expansion certified by the Department of Defense as necessary for defense.

Uncertain—The extent to which such expansion will be approved will not become apparent until the Defense department takes up its present and future requirements.

Senate provisions to extend the life of the Small Defense Procurement Agency were struck out by the House, which substituted a measure providing for a permanent small business agency (see p. 56). Another House amendment classifies as confidential the cost and price information supplied by manufacturers to the Office of Price Stabilization.

Open for Top Charging

Two 70-ton electric furnaces at Republic Steel Corp.'s No. 3 Canton, Ohio, melt shop are being converted like this Chicago plant furnace from side-door to top charging. The move is expected to up their production more than 50 per cent. One furnace will be equipped for induction stirring

CHECKLIST ON CONTROLS

Materials Orders

COPPER—Revocation of NPA Order M-16 on June 4, 1953, effective immediately, removes restrictions on disposal of copper scrap and on toll agreements and lifts limitations on accumulations or inventories of copper scrap.

STEEL—Revocation on June 4, 1953, of NPA Order M-1, Direction 5 to M-1, Order M-6A and Schedules 1 through 5 of M-6A, all effective July 1, removes restrictions on production, use, acceptance of certain orders and distribution of iron and steel products under Controlled Materials Plan. Those products will be controlled by the Defense Materials System after July 1, subject to congressional approval.

POWER, ELECTRIC EQUIPMENT—Revocation of NPA Order M-44 on June 4, 1953, effective July 1, 1953, removes controls over production and delivery of power and electric equipment.

ALUMINUM—Revocation on June 4, 1953, of NPA Orders M-5, M-84 and M-88 and Direction 1 to M-88, effective July 1, removes all NPA controls over production, use and distribution of aluminum. Orders M-5 and M-88 will be superseded by Order M-5A under Defense Materials System.

USED, IMPORTED EQUIPMENT — Revocation on June 5, 1953, of NPA Order M-101, effective July 1, removes controls over the use and distribution of used and imported metalworking equipment.

Atomic Milestone

"Breeding" atomic material conserves scarce uranium, leaves more for industrial uses

A LONG STEP toward realizing industrial power from the atom may result from successful "breeding" of atomic material. This new development of the Atomic Energy Commission means that as much or more atomic material can be created as is burned up in manufacture.

Previously the manufactured atomic material, plutonium, has been produced at a net loss of scarce uranium 235, the "fissionable" fuel for atomic energy that occurs in nature.

New Twist — AEC Chairman Gordon Dean announces that commission scientists at Arco, Idaho, have developed and perfected an atomic furnace which replaces uranium at a rate equal to uranium 235 consumption while changing nonfissionable uranium into plutonium. U-235 will still have to be burned, but not at a net loss.

Mr. Dean says private industry should secure greater participation in atomic work as a result of this development. Atomic power plants may then become a reality. Although America does not have all the fissionable material it needs, the AEC chairman believes we may eventually utilize all the more common U-238 that can be extracted from the earth's surface for atomic fuel.

Industrial Possibilities — "Energy released by the fission of uranium is useful as an explosive and has great potential value for civilian power purposes," says Henry D. Smyth, a member of AEC.

"We have to balance the reasons for making atomic explosives under government monopoly against the many advantages of turning over to competitive industry at least the industrial power aspect of atomic energy."

No Monopoly—Mr. Dean denied charges that the AEC policy of encouraging private participation in atomic power would result in a "giveaway." He believes that the government can and will see that atomic energy is controlled in the public interest—not by monopolistic management.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Imposing tasks loom ahead for Republicans before summer adjournment of Congress. Taft-Hartley, St. Lawrence action may wait until fall

REPUBLICAN leaders in Congress have agreed that the "must" calendar of legislation to be completed prior to summer adjournment comprises these ten items:

Legislation on submerged lands in the outer continental shelf; simplification of customs laws; appropriation bills; extension of the Reciprocal Trade Agreements Act; Pakistan wheat loan; legislation to admit 240,000 Iron Curtain refugees and European nationals; tax legislation; the foreign aid bill; governmental reorganization plans and extension of the Defense Production Act.

Delayed—In all probability to be postponed for later action are the Hawaiian and Alaskan statehood bills, Taft-Hartley amendments, revision of the Old Age Insurance law, a bill to authorize participation in the St. Lawrence Seaway project and limitation of the President's power to make treaties.

This blueprint, of course, is subject to change. Strong outside pressure is being exerted on Congress to finish the job on Taft-Hartley, and not allow long and detailed congressional hearings to go for nothing. Labor spokesmen accuse President Eisenhower of repudiating campaign promises by failing to submit recommendations for Taft-Hartley amendments to Congress.

Three Understand It — Spokesmen of employers say the only senators who know what Taft-Hartley is all about are Robert A. Taft (Rep., Ohio), William A. Purtell (Rep., Conn.) and Barry Goldwater (Rep., Ariz.). Senator Taft has been ill and employers' spokesmen would like to have him available when legislation is passed. The outlook may change if the administration's proposals for amendments to the controversial law are submitted soon.

As usual, many minor bills will be pushed through in the closing days. One is likely to be a measure clarifying the right to sacrifice freight to meet competitors' delivered prices.

Vote To Adjourn—Senate Republicans voted to adjourn July 30, "if we can finish our program." They voted against returning for a fall session. The Senate Democratic Policy Committee has promised cooperation. That target date applies to the House as well. The House usually has to wait for the Senate as adjournment nears.

MSA Program Delayed . . .

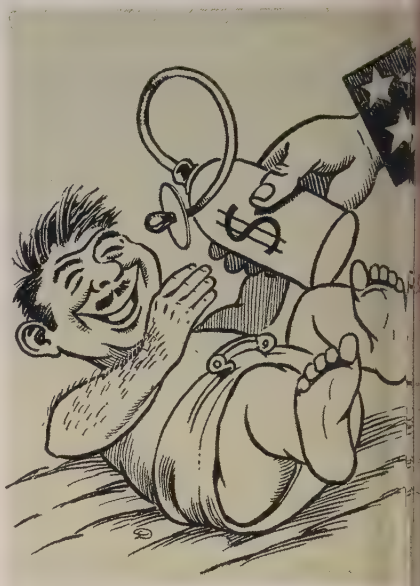
Chairman Styles Bridges (Rep. N. H.) of the Senate Appropriations Committee has asked the Mutual Security Agency to hold up a program to promote foreign industrialization until Congress decides to vote the funds. He wrote MSA Director Harold Stassen that the committee had information causing it to doubt soundness of the program and to suspect undue duplication of governmental effort and spending.

Such industrialization, says a report of a House foreign relations subcommittee headed by Rep. Jacob K. Javits (Rep., N. Y.), can be carried out most effectively through investment of private American funds. The report lists incentives and guarantees which should be offered private investors to encourage investments in foreign countries.

Higher Lead, Zinc Duties . . .

H.R. 5496, a revised version of H.R. 4294, by Rep. Richard Simpson (Rep., Pa.), calls for higher import duties on lead and zinc to protect domestic miners from foreign competition held responsible for closing of many small mines in recent years.

H.R. 5534, by Rep. Albert Morano (Rep., Conn.), would suspend duties on basic aluminum for one year in view of current shortage of supply.



BACK ON GOVERNMENT FEEDING? . . . *will small business come to this?*

Too Much Free Help? . . .

Under H. R. 5141, just passed by the House and likely to receive Senate and presidential approval, the government will adopt permanently the job of shepherding small business. It took on this task during World War II and the postwar emergency period.

A new, permanent, independent Small Business Administration will succeed the present Small Defense Plants Administration with greater powers. While SDPA could approve loan applications for decision by Reconstruction Finance Corporation, the new SBA will have power to make direct loans. It will also have power to take government contracts and subcontract them to small business.

The bill appears designed to assist small, weak firms rather than small, strong ones. This may be deduced from the limitation of "... to $100,000" on single loans and from the stipulation that loans shall be made only when the financial assistance applied for is not otherwise available on reasonable terms. In these days a loan of less than $100,000 does not permit a great deal of industrial improvement or expansion. Sound small firms usually do not need to ask the government for financial aid.

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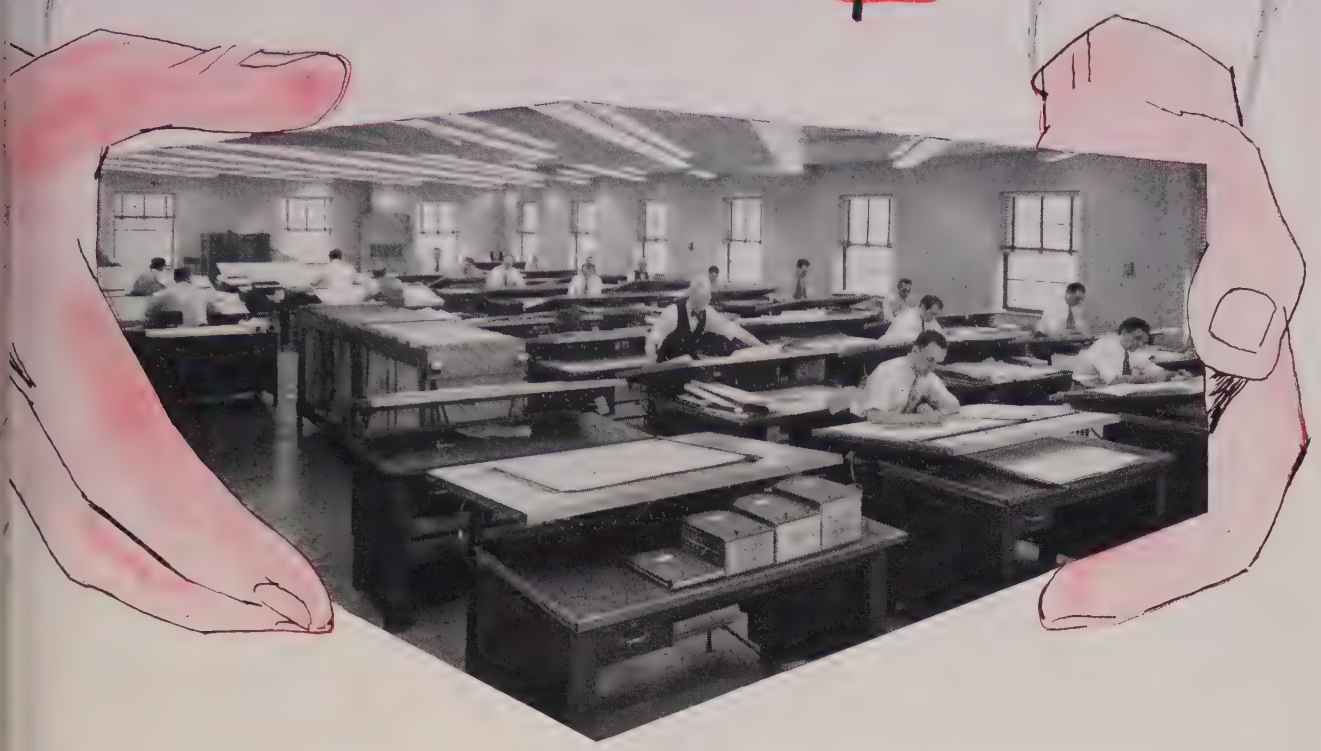

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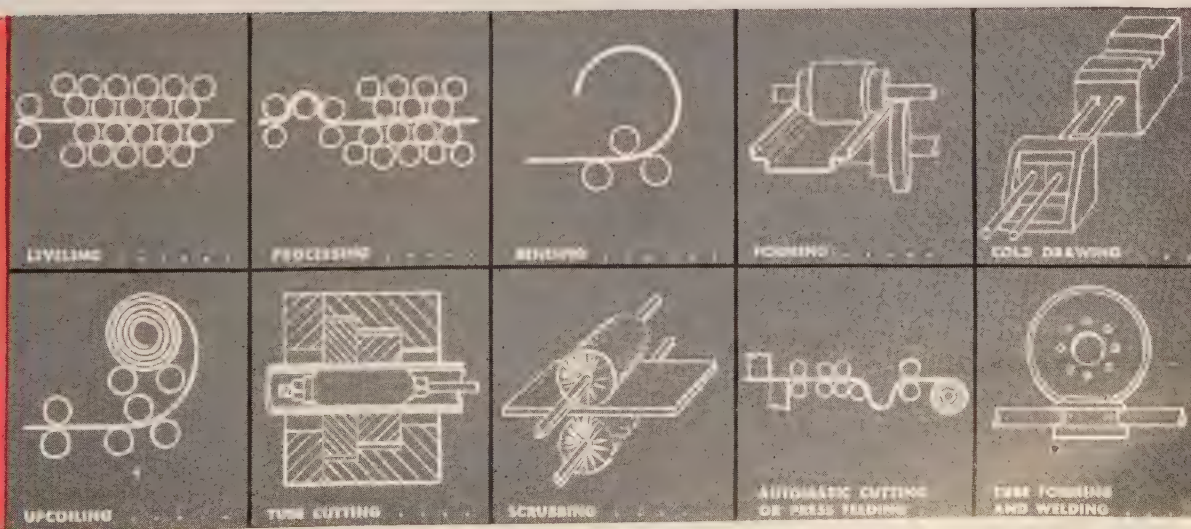

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.s workers gain from increased productivity . . .

Watch Out for Incentive Snares

By M. K. SHEPPARD
Management Consultant
M. K. Sheppard & Co.
Cleveland, Ohio

CONOMIC pressures among in-stry, capital, labor and the con-mer are creating renewed inter-t in wage incentive systems as a eans for increasing productivity. Industry expects in wage incen-es greater production at lower st with added advantages of hap-er employee relations through gher wages. Capital views the age incentive picture as a means gain more profit from invest-ents in machinery, equipment d plant as well as in wages of nployees. Labor sees added in-me per worker and higher stand-rds of living. The consumer ex-cts lower prices as the result of ese savings.

Coverage Grows—It has been es-mated that as of 1952 approxi-ately 50 per cent of all employees U. S. industry were covered by me form of wage incentive. It further predicted that by 1962, 0 per cent of all employees will be aid incentive wages. (See the story n how one actually operates, p. 0.)

All this activity to install incen-ve systems is fundamentally ound thinking with several *very nportant reservations.* Incentive ystems have *serious pitfalls* that an more than offset all the good xpected.

By Definition—Let's briefly de-ine an incentive plan as a method o increase production and decrease nit costs by paying workers high-r wages for increased production s measured by predetermined tandards of quantity and quality.

The basic requirements in any nanufacturing organization for a uccessful wage incentive program nclude a balanced wage rate struc-ure, good labor relations, proper maintenance of equipment and tools, economical methods and equipment layout and engineered standards for measuring performance. Additional requirements are quality standards, a regulated flow of materials, adequate production planning and scheduling and capable supervision.

Problems Appear—When you go beyond the basic idea of wage incentives, you run into various difficulties. For instance, what is normal for a job? How do you arrive at objective standards for measuring the norm that workers can agree on? There are numerous jobs such as maintenance, material handling, clerical work that have always been considered impossible to measure.

Let's examine for a moment some of the pitfalls in establishing a satisfactory incentive system and what can be done to avoid them.

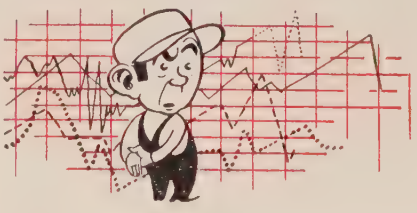
PITFALL: System too complicated.

Any incentive system, to be successful, must be simple enough that the worker can understand it and figure his earnings at all times. A complicated system is a constant source of worker irritation—lowers morale—causes grievances. Every worker in a wage incentive system must be reasonably able to figure his earnings under the system on a daily basis. The real incentive is extra money and the worker must be able to "see" what money he is receiving for the extra effort expended.

Solution—In the proper installation of a wage incentive system it is the function of the industrial engineer to provide for all the fixed and variable factors that make up the workers' daily activities. The industrial engineer should develop simple wage formulas which are reasonably accurate and equitable under all conditions and which are explainable to workers of average intelligence.

All workers must be able to know how much they are going to get paid for the work they turn out each hour and day. The simplest formula is that used in a piece rate system where pieces produced multiplied by the rate per piece produce the piece rate earnings for any period—hour, day or week.

In a standard hour system which is the equivalent of piece rate but has other advantages, the worker can multiply the pieces he produces by the standard hours per piece or



per hundred pieces to give him his standard hours earned per day. Then by simply multiplying his standard hours earned by the standard hour earning rate he can arrive at his pay for the day.

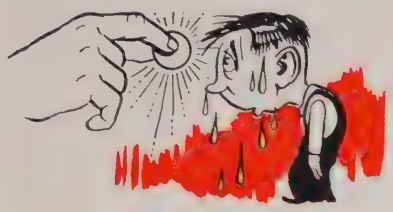
But remember, the *incentive* in any wage incentive system is *money,* and in order to work satisfactorily the worker must be able to know his incentive earnings at all times.

The above two incentive formu-

las are the simplest and most generally used in industry today and pay the worker in direct proportion to increased effort and output. After the worker has earned the equivalent of his base rate, the labor cost of each unit of production is constant and there is no direct labor-saving regardless of the increase in productivity. All the labor saving is paid out to the workers.

PITFALL: Little relationship between worker effort and pay.

An incentive system to operate effectively should reward extra effort with equivalent extra compensation. When compensation is not



proportional to worker effort, the incentive system will not function properly. The causes of this unhappy situation are generally twofold: Standards were carelessly set, or methods were gradually improved without equivalent changes in standards to maintain their accuracy.

Unfortunately whenever standards are too loose workers never tell management so but continue to hold out for these loose standards as "fair." When standards are too tight workers are sure to tell management and lobby to have the tight standards loosened. Therefore tight and loose standards *never average out* and the tendency always is towards constantly loosening standards.

Solution—The solution to the above problem is twofold. First, we recommend establishment of job standards by competent incentive engineers with a fool-proof reporting system to "flag" changing methods and conditions so that new standards can be developed within a reasonable period of time.

It is absolutely essential that each standard have a complete description of all the conditions that existed as the basis for the setting of the standard so that measurable changes in conditions effecting the standard can be compared and reflected in corresponding changes in the standard.

Second, we strongly recommend an extended trial period to check under actual operating conditions the accuracy of the standards set and the effectiveness of the provisions developed for meeting contingencies that arise in everyday operation of each worker's job. It is important to note that no incentive pay is paid any worker during the trial period so that errors in standards and contingency provisions can be easily changed or corrected without worker grievance.

PITFALL: Abnormal condition allowances.

Every wage incentive system makes allowances for abnormal conditions such as power failure, machine breakdown and tool failure. These extra allowances are made to the worker at the foreman's O.K. All these allowances add to the earnings of the worker, which in turn adds to production costs, but these allowances may or may not show up in the percentage performance reported for the worker.

Any operating or accounting official who looks simply at the performance rating and not carefully at the amount of allowances and

the unit cost of the product will be misled into thinking his costs are going down when they are actually on the increase.

Solution—Obviously the worker on incentive pay cannot be expected to stand the loss in pay for delays and interruptions that are beyond his control. In a well-regulated plan, abnormal condition allowances are made to the worker. However, a tight check should be made on all allowances to insure that they are deserved and not excessive and given only after due consideration of the causes.

Records of all these allowances should be kept for higher management information, and a regular procedure developed to bring about a correction of these abnormal conditions.

PITFALL: Rating foreman on reported performance of his group.

When foremen are rated on the performance of the group of workers under their supervision, there is a tendency for the foremen to favor the worker and loosen standards. In this situation it is not unusual to have the foreman influencing the time study people in the work

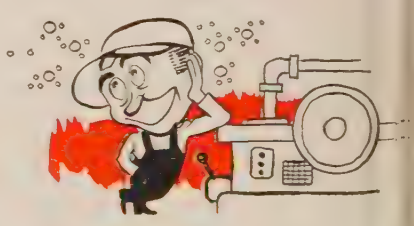
ers' favor. He wants his group's percentage of performance to be the best possible and the looser the standards in his department, the better showing his group can make.

Solution—Foreman performance should always be measured by the over-all costs of the products of his work force. Foremen should never be measured on the indicated percentage performance of the workers. While it is perfectly correct to measure the individual worker on his performance against standard, the foreman's responsibility is to get maximum scheduled output at minimum total cost.

The average performance percentage of his men will not necessarily give lower operating costs because of varying amounts of allowances, delays, and nonstandard conditions which are the foreman's responsibilty to minimize.

PITFALL: Lowering supervision effectiveness.

There is a tendency over a period of years for the wage incentive system to lower the effectiveness



of supervision. There is too much dependence on incentives to keep production rolling. Incentives put the production rate in the hands of the employee. Too often the s

ervisor believes that takes the roblem out of his hands. But, if ie workers fail to hustle despite ie incentive, production drops off id supervision tends not to accept ie responsibility for the decrease.

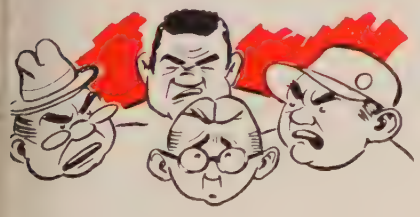
Solution—It is essential that the oreman know at all times what onstitutes a fair day's work for ach employee in his department. e must be able to train his em- loyees to work properly. The fore- an also must be trained to oper- e a wage incentive system prop- ly.

PITFALL: Undue pressure on me study engineers.

In many incentive plans the time udy engineer is the forgotten an with pressure applied to him workers, union officials and oremen without adequate support om management. Too many time udy men in this position tend to e "nice fellows" and set standards hat are too loose to be effective.

Solution—It is only human that me study men subject to pressure om union, workers, industrial re- tions and foremen will tend to soften" unless adequate checks nd balances are established. In ur experience it is nearly impos- ible to maintain a strict factual osition against all the above op- osition unless the time study men ave the *right of appeal to higher uthority.* The answer is simply his—any company that wants to stall a successful incentive sys- em must provide a direct channel or appeal to an officer of the com- any.

In a small company this is ac- omplished by having the engineer esponsible for operating and main- aining the incentive system re- ort to the general manager or the



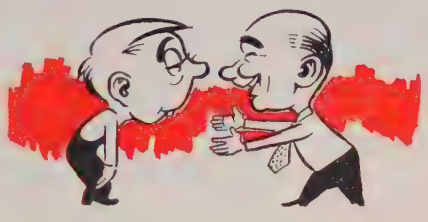
ice president in charge of opera- ion.

In a multiplant operation the ndustrial engineer should report o the local plant or general man- ger. But—and this is important— here should be an open channel of functional authority for the local engineer to appeal to a staff industrial engineer reporting directly to a vice president.

PITFALL: Relaxing standards when labor is scarce.

When labor is scarce and competition for workers is keen, there is a general tendency to relax standards—to make a better deal for the worker. Too often this temporary measure to hold old help and to entice and hoard new help continues on after the emergency has passed.

Solution—All precautions should be taken in both prosperity and curtailment to maintain the fundamental accuracy of every standard used for wage incentive programs. To relax these standards is every bit as dangerous in the long run as it is to relax the quality of the



company's products. Relaxed standards are bound to boomerang eventually.

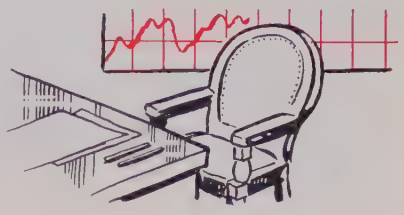
It is far more difficult to correct adulterated standards after they have been in use for an extended period of time than it is to set up the original standard and incentive program. In many cases of adulterated standards it is necessary to cancel out the entire incentive system.

PITFALL: Lack of competent incentive engineers.

There's a mistaken notion among management that once an incentive system is installed it will operate itself. All too often the industrial engineer who installed the system is "promoted" to other duties and the system left in the hands of clerks.

Solution—The price of success of any incentive system is eternal vigilance. The only solution to this problem is to establish qualified administration of the system with fool-proof reporting methods to "flag" changing methods and conditions.

Any company intending to operate a sound wage incentive policy should maintain a competent staff of time study, standards and methods engineers continually at work improving methods, tools and lay-



out, refining and modernizing the standards structure.

When Costs Drop—With most incentive payment formulas now in use, there is little cost reduction through higher efficiency once the wage incentive premium is being regularly earned. The big saving comes where low performance is originally raised to the premium level. Economy lies in improved methods, simplified work procedure, better tools, mechanical material handling and elimination of employee work elements.

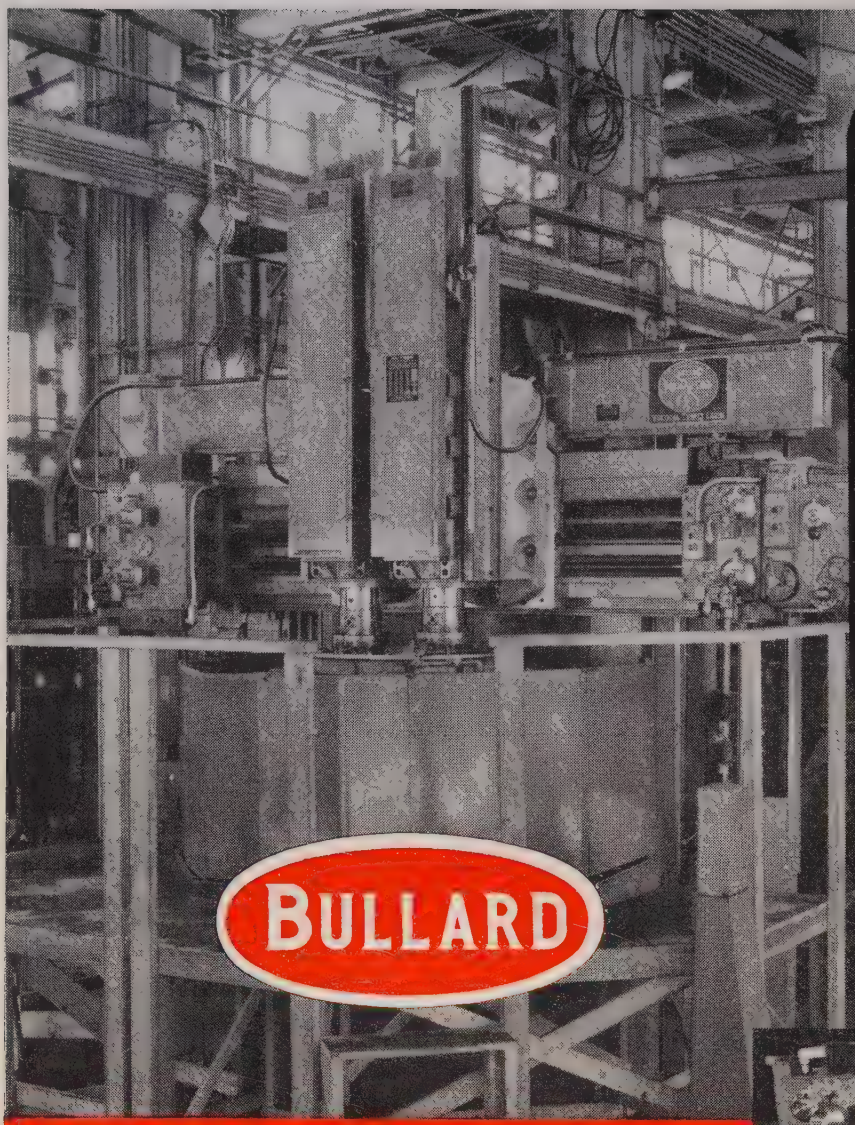
Complete Plan — Formulate a complete wage incentive policy. Establish official attitude of management, the part played by supervision including foremen and the relationship with employees and their representatives. Develop in complete detail the objective of this policy and the procedure to be followed in its development and operation.

Organize and staff a permanent industrial engineering department to install, operate and maintain the standards and incentive program.

Employ a competent consultant well versed in all phases of the installation and operation of the type of incentive system best suited to the conditions and employees in your plant.

Maintain a constant, conscientious and continuous policy and procedure throughout the life of the wage incentive plan.

True, incentive systems have serious inherent pitfalls that must be avoided at all costs. The answer in establishing successful incentives in any company is the application of sound engineering principles by experienced capable engineers. Properly set up, with correct mechanics for maintenance, an incentive system can be a vital "production and cost control tool" in any company.



PRECISION

JET ENGINE WORK

MACHINED ON

Man-Au-Trol

VERTICAL TURRET LATHES

BULLARD

The job illustrated was orginally a problem job but was nicely solved by application of this method. The machine, work finish and times have proved more than satisfactory.

This particular Man-Au-Trol Vertical Turret Lathe was tooled for machining J47 jet engine compressor cases. However many other Man-Au-Trols are working on a variety of jet engine parts and numerous manufacturers not on defense work find these machines ideally suited to their production economy.

You too should investigate the possibilities and savings which these machines might afford on your work.

OPERATION DETAILS

ROUGHING

Rough bore I.D. with right ram.
Rough face and counterbore, turn O.D. with left ram.
Rough 5 large grooves with right ram.
Rough 7 small grooves with left ram.
Underface bottom and turn O.D. with right ram.

FINISHING

Finish bore I.D. with left ram.
Finish face and counterbore with right ram.
Finish 5 grooves with right ram.
Finish 7 grooves with left ram.
Finish underface bottom.

"Ask for Estimates on Your Work"

THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT

By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom

Ford

New problems, new techniques to meet them are on the agenda as . . .

Auto engineers, meeting in Atlantic City, study preignition problems, point to the growing use of automatic transmissions, power steering and aluminum extrusions

ATLANTIC CITY, N. J.

AT ATLANTIC CITY auto engineers gathered last week amid the atmosphere of revelry to remind themselves that they still have problems.

The occasion was the 1953 annual summer meeting of the Society of Automotive Engineers, and topics on the agenda ranged from A-bombs to evaluation of riding comfort. The persistent demands of Harry Horsepower were there too, and his haunting memory was clamed for more than one dubbed shot at the Seaview Country Club.

Preignition—A good example is the matter of preignition. It was present in varying degrees in almost all of 30 cars tested by Sun Oil Co., reports R. F. Winch, research engineer. In many cars the tendency to preignite is becoming worse as horsepower goes up. Octane helps suppress the noise of wild ping but is relatively ineffective in controlling the real trouble, preignition.

One suggested aid in solution to the problem is the elimination of surface irregularities in the piston dome since pistons with the most pronounced surface irregularities are consistently in the most serious preignition difficulty. Improved anodization techniques in aluminum pistons could be a factor in the solution of the problem and better surface finish is bound to come for close scrutiny. Another tip in the preignition problem comes from S. D. Heron, consulting engineer of Ethyl Corp. He points out that with increased volumetric efficiency spark plugs must be reasonably "hot" to perform satisfactorily in traffic. However, for high speed driving on the open road, a cooler plug must be used if preignition is to be avoided. American engineers have begun to feel the need to follow the practice of the European sports car owner who willingly changes from hot to cold plugs for the open road.

Door to Greater Use?—Aluminum extrusions were much talked about by the auto engineers and seen on the threshold of wider use. L. H. Nagler of Nash-Kelvinator Corp. drew a great deal of interest as he discussed Nash's two-section door construction. The upper section is an extruded aluminum part forming the frame for the window and is subassembled complete with glass runs and vent window and bolted onto the door in final assembly. This two piece construction permits fitting the upper and lower portions of the door to the body seals independently, gives good visibility in the front pillar area, eliminates complex cam dies used in making single piece doors and permits use of the same lower door panels for hard tops and convertibles as well as sedans by varying the upper half.

The aluminum gives greater strength and lighter weight than steel, says Mr. Nagler who also claims that the durability of good quality anodized aluminum is superior to that of straight-chrome stainless steel commonly used for exterior trim. Extruders, whose number has swelled from 8 to 60 recently, feel confident that their product will find use shortly in garnishing and rub molding as the nickel shortage continues. Anodic coatings 0.0025 inch thick can be deposited in 11 minutes giving a diamond-hard surface which is highly resistant to abrasion. The ability of aluminum to resist gouging is a function of the softness of the metal itself, however, and is only slightly reduced.

Better Starts—Bus riders are no longer rolling in the aisles as torque converters took over on more than 95 per cent of 40-passenger and larger buses sold last year, say P. L. Gillian and W. S. Coleman of White Motor Co. Ability of the torque converter to meet changing torque requirements under varying driving conditions automatically and low maintenance costs overcome the somewhat diminished gas mileage and higher initial cost in determining buyers' preference for the unit, they say.

W. W. Edwards of GMC Truck & Coach Division, General Motors Corp., reports that drivers threaten to quit if their Hydra-

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matic-equipped trucks are taken away from them. Available for the first time this year on trucks up to one ton, the unit is reported enjoying wide demand and indications are that automatic transmissions will shortly be available for trucks of all sizes.

Power Steering—Saginaw Steering Gear Division of General Motors, after having made over half a million integral type power steering units, is now reported supplying a linkage power steering unit to one of the independent auto firms which should hit the market shortly. Engineers from Ross Gear & Tool Co., Gemmer Mfg. Co., Bendix Products Division, Monroe Auto Equipment Co., and Saginaw Steering Gear Division, concluded that lower tooling costs for the linkage type as well as its ability to adapt to cars already built assure this type a solid future, though the integral type offers maximum protection from road damage, and should dominate in high volume producers' products.

Current cost of the two types is approximately $130 minimum for linkage power steering and $170 minimum for integral power steering. The latter figure is reported to be due for a 10—15 per cent slash next year by Saginaw when GM models change.

Car of the Week

A trip to Atlantic City in an air conditioned Oldsmobile 98 is definitely among the nicer things in life, and on the journey from Detroit the Olds acquitted itself as a good compromise between cushiony ride and roadability. The car displayed a tendency to mash somewhat on moderately tight turns but that is to be expected in a heavy car softly sprung with doughnut-type tires.

Acceleration is good on breakaway and outstanding under passing conditions. Visibility was good and interiors are well appointed. A particularly pleasing little gimmick was the sensible location of the glove compartment in the center of the dash board where it is accessible to the driver as well as to his passenger.

Air conditioning, however, was the inordinately bright spot of this particular car. With an exterior air temperature of 92 degrees, motorists cruising the Pennsylvania Turnpike found themselves facing a disheveling blast of hot air while the Olds was buttoned up tight with no wind noise or drafts and a temperature of about 75 degrees. Two blower positions and two cooling level positions give good flexibility to temperature control and the actual heat exchanger unit occupies relatively little trunk space. Annoying, however, are the two plastic ducts leading from the shelf behind the rear seats into the roof ducts. Though transparent in some degree, they reduce visibility to the sides and lend a tacked on appearance to the installation.

It was also evident that the heat dissipation coils located in the front of the car are much less effective when the car is driven in stop-start traffic where cooling is needed most.

Summing up, the Oldsmobile 98 is a lively, comfortable car in itself and equipped with air conditioning it makes 12 hours of steady driving a very effortless business.

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453	570,464
May	685,396	542,559
June		542,478
July		226,134
August		322,755
September		595,715
October		656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
May 9	179,621	130,537
May 16	177,305	129,945
May 23	162,447	127,759
May 30	125,868	104,935
June 6	136,157	128,837
June 13	166,000*	130,544

Sources: Ward's Automotive Reports.
*Estimated by STEEL

New Transmission for Chrysler

A new automatic transmission which eliminates the clutch pedal is announced by Chrysler Division of Chrysler Corp. following a long period of trial and development. The unit is now available only on Imperial models as production at the new Indianapolis plant still holds at preliminary stages.

One estimate places current production at only 400 units weekly with ultimate output expected to reach well over 3000 weekly. The fact that the transmission was in the works has been no secret in automotive circles for some time and Chrysler engineers have been busy during that period.

A test drive of a Custom Imperial equipped with the device reveals that the new transmission combines the contradictory virtues of smoothness and good breakaway performance in a remarkable degree, while the passing kick down at speeds up to 55 miles an hour really boots the car around in exhilarating style.

Responsible for the fine performance of this new transmission is a torque converter developing 2.6 multiplication at breakaway through a 1.72 planetary setup to yield a final torque multiplication of 4.47. The unit employs a second planetary setup for reverse and makes one shift when the engine load lightens in acceleration.

It seems reasonable to expect that when production is rolling the unit will appear not only on the remainder of the Chryslers but on other cars of the Chrysler Corp. as well. Officials report, however, that the previous transmission will remain on most Chrysler products for some time to come.

Battery Leads a Double Life

Described by the makers as "revolutionary," a new automobile battery developed by Willard Storage Battery Co., Cleveland, affords automatic power adjustment to meet varying demands of winter and summer driving.

A manually-operated key adjusts the battery's water capacity to meet seasonal requirements. For winter driving, the battery will accept a limited amount of water. Adjusted for summer driving, the greater water capacity results in lowering the battery's acid gravity and providing greater resistance to damaging effects of overcharging.

Willard's "Weathermaster" will be distributed in September.

ARISTOLOY STEELS
STANDARD STRUCTURAL ALLOY • BEARING QUALITY
ALLOY TOOL • SPECIALTY • NITRALLOY • CARBON
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Hot Rolled • Forged • Annealed • Heat Treated • Normalized
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Houston 20, Texas
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How to get the most for your tube steel dollar: Ask the experts!

This month the Timken Company reports on:

18-8 STAINLESS

An austenitic, non-magnetic alloy that shows the best combination of creep strength, oil corrosion resistance and oxidation resistance for service up to 1500°F. For use in oil cracking systems, hydrogenation equipment, high temperature oil and steam piping, superheater elements, heat exchangers.

ONE OF 24 TIMKEN HIGH TEMPERATURE STEELS

Carbon	Sicromo 2	Sicromo 5S	18-8 Ti
Carbon-Mo.	Sicromo 2½	Sicromo 5MS	16-13-3
DM-2	2½% Cr.-1% Mo.	Sicromo 7	25-20*
Silmo	Sicromo 3	Sicromo 9M	25-12*
DM	4-6% Cr.-Mo.	18-8 Stainless	35-15**
2% Cr.-Mo.	4-6% Cr.-Mo.-Ti.	18-8 Cb	16-25-6**

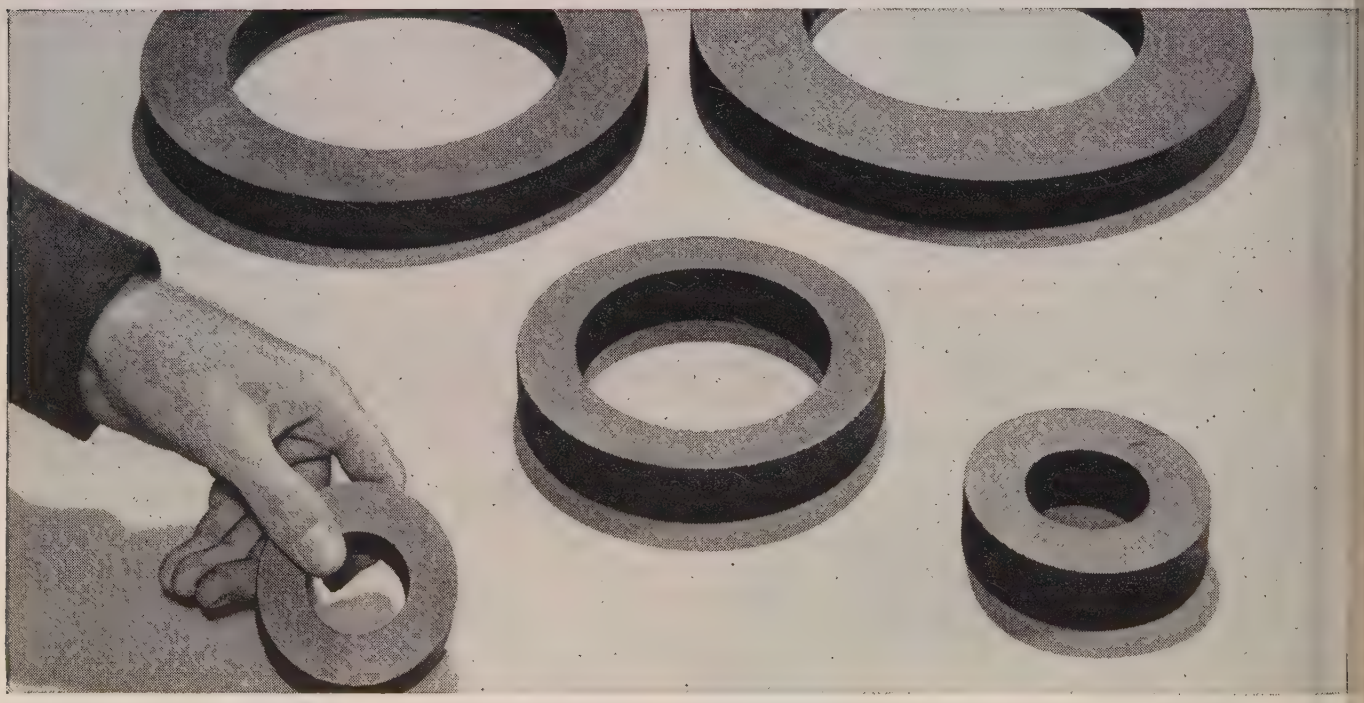
** Available as seamless tubing on an experimental basis only.*
***Not available as seamless tubing.*

ALTHOUGH several high temperature steels may be the answer to your heat, pressure, corrosion and oxidation problems, there's only one analysis that will give you maximum tube life per dollar spent—the best life/cost ratio.

To find it, *ask the experts!*

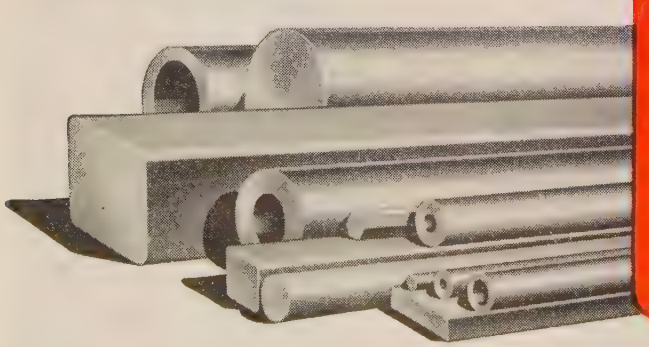
The Timken Company's metallurgists — recognized authorities on high temperature steels, with over 20 years of steel research and experience—will help you select from 24 different analyses, the one steel that will give you the most for your money. And no matter which analysis you select, you'll be sure of uniform quality because the Timken Company rigidly controls quality from melt shop through final inspection.

Let Timken's "RSQ"—Research, Supply, Quality—solve your tube problems. *Ask the experts!* The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".



Typical examples of Timken heavy-wall pressure tubing—available in sizes up to 10 1/2" O.D.

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



TIMKEN
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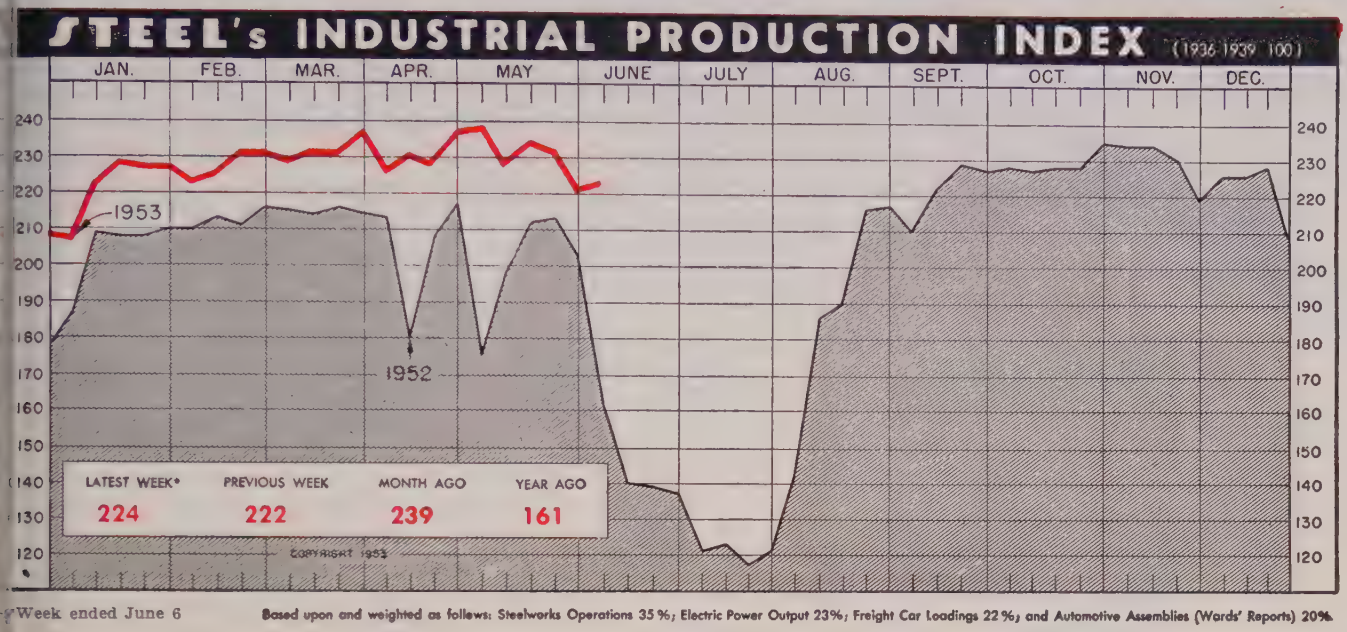
Fine Alloy
STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING


STEEL's INDUSTRIAL PRODUCTION INDEX (1936-1939 100)
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
240 230 220 210 200 190 180 170 160 150 140 130 120
1953
1952
LATEST WEEK* PREVIOUS WEEK MONTH AGO YEAR AGO
224 222 239 161
COPYRIGHT 1953

*Week ended June 6

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%.

Industrial production recovers some of the momentum it lost during strikes that hindered auto output. Index is now halfway between year's high and low marks

RECOVERY of industrial output from the lowest ebb since the first of the year marks the latest week. Measuring this increase, STEEL's industrial production index for the week ended June 6 edged up 2 points to 224 per cent of the 1936-1939 average. STEEL's indicator is now midway between 1953's record high of 239 points, reached only a month ago, and the year's low mark, registered in the first week in January.

Sparking the upturn was a slight rise in automobile outturn. Freight car loadings remained steady. Easing downward in the June 6th week was steel production. Electricity production edged up slightly.

Obstacles for Autos . . .

Still continuing to plague the independents in the automobile industry as well as the Ford Motor Co. is the stoppage in the flow of transmissions and parts resulting from the strike at the Muncie, Ind., plant of Borg-Warner Corp. Upon settlement of a strike at Ford Motor Co.'s Canton, O., forge plant the company placed its Buffalo assembly plant on an overtime schedule for the summer.

Reflecting the recovery of automobile production, U. S. and Canadian plants in the week ended June 6 produced 136,157 passenger cars and trucks, an increase of 10,289 vehicles from the previous week, says *Ward's Automotive Reports*. In the comparable week in 1952, output totaled 128,837 units.

Even with supplier strikes, January-June automobile production will be above the first half output reached in the industry's record year 1950. Motor vehicle registrations for 1952 support the optimism that has permeated the industry this year. The count moved up by only 1,344,000 units even though 5,200,000 vehicles were turned out for domestic distribution. This indicates a high scrappage rate of old vehicles and a tremendous retail market.

Inventories Set Record . . .

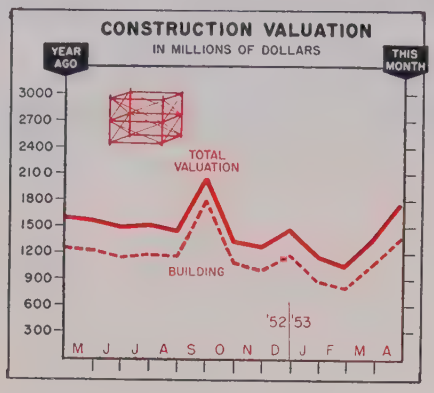
Inventories of retail automotive dealers account for about two-fifths of the increase in total durable goods holdings that took place in April, the U. S. Office of Business Economics reports. During that month, total business inventories rose about $100 million to reach a record high figure of $77 billion. Even with a less than seasonal decline in nondurable goods, durable goods increased more proportionately.

Capacity Pace for Steel . . .

With inventories rising, it's possible a production cut is in the making for the steel industry. Presently the steel industry is loaded with orders and production is still strong. The American Iron & Steel Institute estimates that in the week ended June 13 furnaces were operated at capacity and poured about 2,252,000 net tons of steel for ingots, castings.

More Freight Cars Loaded . . .

Loadings of railroad freight cars have continued to show improvement during the past three months, when compared with the same months in 1952. During the week ended May 30 a total of 786,755 cars were loaded, according to the Association of American Railroads. Loadings that week were 2.2 per cent above the preceding week and 12.9 per cent higher than the corresponding week in 1952. Although car loadings up to date are less than a year ago, the railroads—as with industry in general—have increased their net income. During the first four months net in-

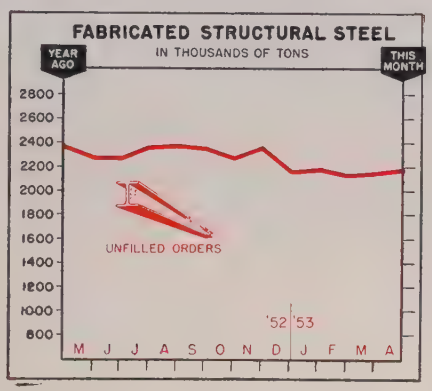


Construction Valuation

(37 States)—In Millions of Dollars

	Total		Building	
	1953	1952	1953	1952
Jan.	1,075.9	902.1	867.0	695.4
Feb.	1,021.3	885.2	792.9	697.8
Mar.	1,347.5	1,321.3	1,054	1,056.0
Apr.	1,741.5	1,597.5	1,354.2	1,243.9
May	.....	1,563.6	.....	1,216.2
June	.....	1,488.8	.....	1,133.3
July	.....	1,511.3	.....	1,170.8
Aug.	.....	1,438.7	.....	1,147.5
Sept.	.....	2,039.2	.....	1,790.8
Oct.	.....	1,310.1	.....	1,072.8
Nov.	.....	1,248.8	.....	989.9
Dec.	.....	1,467.4	.....	1,147.7
Total	.....	16,774.9	.....	13,362.1

F. W. Dodge Corp.

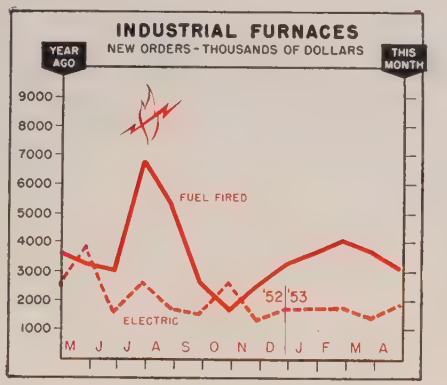


Fabricated Structural Steel

Thousands of Net Tons

	Shipments		Backlogs	
	1953	1952	1953	1952
Jan.	241.4	244.9	2,180	2,416
Feb.	251.1	246.4	2,128	2,408
Mar.	266.3	268.8	2,155	2,501
Apr.	259.7	230.7	2,168	2,350
May	....	244.2	....	2,263
June	....	125.5	....	2,261
July	....	138.3	....	2,361
Aug.	....	226.3	....	2,363
Sept.	....	227.6	....	2,342
Oct.	....	261.7	....	2,266
Nov.	....	222.6	....	2,357
Dec.	....	225.2	....	2,153
Total	....	2,664.3		

American Institute of Steel Construction

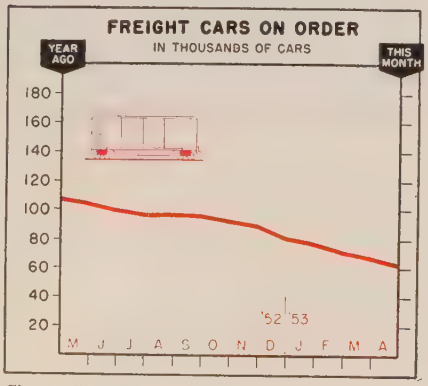


Industrial Furnaces

New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1953	1952	1953	1952
Jan.	3,540	3,379	1,655	2,856
Feb.	3,996	2,413	1,672	1,363
Mar.	3,607	1,813	1,301	2,100
Apr.	3,017	3,606	1,796	2,298
May	....	3,032	....	3,713
June	....	2,954	....	1,552
July	....	6,728	....	2,530
Aug.	....	5,259	....	1,626
Sept.	....	2,462	....	1,412
Oct.	....	1,507	....	2,459
Nov.	....	2,382	....	1,241
Dec.	....	3,235	....	1,634

*Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.



Freight Car Awards and Backlogs

	Awards		Backlogs*	
	1953	1952	1953	1952
Jan.	5,536	5,338	77,414	120,251
Feb.	2,284	7,358	71,883	118,900
Mar.	3,379	5,619	68,553	115,854
Apr.	2,432	397	62,637	108,270
May	....	2,502	.....	103,910
June	....	3,264	.....	99,615
July	....	1,536	.....	95,265
Aug.	....	4,558	.....	95,761
Sept.	....	3,628	.....	95,377
Oct.	....	1,423	.....	90,708
Nov.	....	2,878	.....	87,657
Dec.	....	1,159	.....	80,296
Total	....	37,261		

*End of month.
American Railway Car Institute

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Issue Dates on other FACTS and FIGURES Published by STEEL

Durable Goods ...May 4	Machine Tools ....Apr. 27	Refrigerators .....May 18
Employ., Metalwk..May 4	Malleable Castings..June 8	Steel Castings ....June 8
Employ., Steel ....June 1	Prices, Consumer ..May 4	Steel Forgings ....June 8
Foundry Equip. ...June 1	Prices, Wholesale ..June 1	Steel Shipments ...May 4
Gear Sales .....May 18	Pumps .....June 1	Vacuum Cleaners...May 11
Gray Iron Castings..June 8	Radio, TV .....May 25	Wages, Metalwk. ..Apr. 27
Indus. Production..Apr. 27	Ranges, Elec. ....Apr. 13	Washers .....May 11
Ironers .....Apr. 13	Ranges, Gas .....May 18	Water Heaters ....May 11

come of the railroads has increased almost 34 per cent over the same period a year ago.

Electric Output High . . .

Helping too in keeping the wheels of industry moving at a rapid pace is electric energy output. It continued at a high level of about 7.97 billion kilowatt-hours during the week ended May 30, says Edison Electric Institute. This figure is 16.3 per cent greater than the amount distributed in the corresponding week a year earlier. Electric utility production for the 12 month period ended Apr. 30 set a new record of approximately 411.1 billion kilowatt-hours.

National Income Rises . . .

Accompanying high industrial production is a rising rate of national income. Pay raises won by autoworkers and in prospect for the steelworkers are expected to boost appreciably the $283 billion national income rate that prevailed in March and April. During those months the slight rise in nonfarm income offset the small decline in farm income, the U. S. Office of Business Economics reports. Half of the increase in nonagricultural income occurred in manufacture of durable goods, where there were light increases in both employment and wage rates.

Bank Clearings Up . . .

A good indicator of the tempo of business is the volume of bank clearings. The average daily volume in May was $2923 million, an increase of 7.6 per cent over the average daily rate in May, 1952 and only slightly less than the average of $2928 million recorded in April of this year, according to Dun & Bradstreet Inc.

Radio, TV Production . . .

Radio and TV production during the first four months of this year is considerably above the same period in 1952. Radio production during this period totaled 4,993,720 sets, an increase of 38 per cent estimates the Radio-TV Manufacturers Association. TV registered an even more impressive over-the

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	100.0	100.5	Na.[8]
Electric Power Distributed (million kwhr)	8,096	7,956	7,005
Bituminous Coal Output (daily av.—1000 tons)	1,437	1,458	1,388
Petroleum Production (daily av.—1000 bbl)	6,360[1]	6,356	6,081
Construction Volume (ENR—millions)	$215.2	$291.3	$225.9
Automobile, Truck Output (Ward's—units)	136,157	125,868	128,837
TRADE			
Freight Car Loadings (unit—1000 cars)	790[1]	787	684
Business Failures (Dun & Bradstreet, number)	217	168	120
Currency in Circulation (millions)[3]	$29,980	$29,825	$28,842
Dept. Store Sales (changes from year ago)[3]	0%	+7%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,863	$16,604	$14,776
Federal Gross Debt (billions)	$2667	$265.2	$260.0
Bond Volume, NYSE (millions)	$19.8	$15.8	$14.5
Stocks Sales, NYSE (thousands of shares)	6,535	5 843	6,266
Loans and Investments (billions)[4]	$75.9	$76.0	$73.8
United States Gov't. Obligations Held (billions)[4]	$28.8	$28.8	$31.9
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	182.82	182.82	171.92
STEEL's Nonferrous Metal Price Index[6]	224.0	224.0	223.7
All Commodities[7]	109.8	109.8	111.8
All Commodities Other Than Farm and Foods[7]	113.4	113.5	113.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1953, 2,254,459; 1952 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100. [8]Not available.

year increase as production was boosted 70 per cent to 2,827,821 units. Between February and April, however, there has been an appreciable drop in TV production. With high hopes of widening a newer market and of enlarging an older one, manufacturers introducing their 1954 models are stressing high fidelity phonographs and radio-phonograph combinations.

Birth Rate Edges Up . . .

Long term forecasts for the entertainment industry, as well as many others, are buttressed by the national birth total. The birth rate continued to rise during the first quarter after setting a new annual record of 3,889,000 births in 1952. At an increase in rate of 3 per cent, births in the first quarter were running about 29,000 ahead of the same period last year, according to the U. S. Dept. of Health, Education & Welfare.

Homebuilding Increases . . .

With a greater population more homes are needed. New construction expenditures rose 10 per cent during May to $2.9 billion, 6 per cent above May, 1952, according to the Bureau of Labor Statistics. Private construction during May advanced almost 9 per cent above the April level and accounted for nearly the entire gain over last year. The increased outlays for the most part were for new dwelling units and commercial building. Mass housing awards in May came in for a large share of it.

Coal Output Lagging . . .

Bituminous coal production continues its greater than seasonal decline. The National Coal Association estimates the bituminous coal production in the week ended May 30 declined to 8.8 million net tons from the previous week's output of 9.1 million tons. Although this production is higher than the 8.3 million tons mined in the corresponding week in 1952 the decline is evident in that at this same time last year demand was considerably down due to the steel strike.

Trends Fore and Aft . . .

Sales of pumps in April rose 22 per cent above April, 1952 . . . Factory sales of mechanical stokers in the first four months of 1953 plunged 27 per cent under sales in the same period last year. . . Department store sales in May climbed about 6 per cent above the same month of 1952. . . Government spending now accounts for about 23 per cent of the total national output.

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A *greater variety* of fasteners and small parts that can be made *faster, stronger* and more *economically* by Pheoll's cold heading and roll threading methods. Cold working of wire stock often surpasses turning, casting, stamping, drawing or molding.

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LOWER PRODUCTION COST . . . due to high production rate. Cold-heading . . . entirely automatic, is not affected by operator skill, strength or fatigue.

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INCREASED TENSILE STRENGTH . . . Improved physical properties are imparted to all metallic fasteners by cold working.

GREATER TOUGHNESS and FATIGUE RESISTANCE . . . because grain flow of material is compacted and directed to follow contour of piece.

UNIFORMLY HIGH QUALITY PARTS . . . assured because cold working requires materials free from structural defects.

Single or multiple secondary operations can be performed on cold headed parts to produce special characteristics required to fit the part for its particular application. Such operations include drilling, tapping, milling, shaving, flattening, notching, flanging, trimming, bending, off-setting, slotting, fluting swaging, knurling, pointing, heat treating, plating and finishing—all in Pheoll's modern plant.

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...for wide range of applications
– PRICE SAVINGS AVERAGE 25%!

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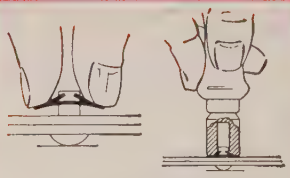
Call or see your Tinnerman representative for full, cost-saving information about these new, low-priced Push-On type SPEED NUT brand fasteners.



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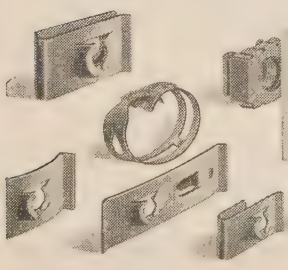
SPEED NUTS
...are one-piece, self-locking, spring steel fasteners. Start by hand...zip down over integral studs, rivets, tubing, nails, any unthreaded parts; bite lock on smoothest, hardest surface!

Send today for copy of "Greater Savings Than Ever with C12000's"; also FREE Production Samples! Write: TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners Ltd., Hamilton, Ontario. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S. A. – 7 rue Henri Barbusse, Levallois (Seine).



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MORE THAN 8000 SHAPES AND SIZES

Men of Industry

HARDAGE L. ANDREWS
. . . new Jones & Lamson president

RANDOLPH J. ROSHIRT
. . . Aluminum Industries v. p.

PHILIP M. GINDER
. . . New Jersey Zinc v. p.

Jones & Lamson Machine Co., Springfield, Vt., elected **Hardage L. Andrews** president to succeed **K. Hazen Woolson**, resigned. Mr. Andrews formerly was executive vice president, General Electric Co. Mr. Woolson will continue to serve as a director and was appointed vice chairman of the board. Mr. Andrews served General Electric in various executive capacities for many years. He retired in the fall of 1951 under the company's optional retirement plan.

E. M. Swartz was elected vice president, **United States Radiator Corp.**, Detroit. He is responsible for supervision of manufacturing for the steel division.

Ralph J. Venning, who joined **Cleveland Steel Tool Co.**, Cleveland, two years after it was founded in 1906 and has been president since 1924, was elevated to board chairman and is succeeded by **Edgar A. Brown**, who continues as president of Edgar A. Brown Inc., also of Cleveland.

Lyman K. Shepard, a development engineer with Delta Power Tool Division, **Rockwell Mfg. Co.**, Pittsburgh, since 1946, was named sales manager, Air-Hydraulic Drill Unit Division, newly created to manufacture and sell the air-hydraulic drill unit developed by Delta.

Randolph J. Roshirt was elected vice president, **Aluminum Industries Inc.**, Cincinnati. He will be on the staff of John W. Craig, president, and will be responsible for integrating the company's production and sales operations. He also will be in charge of new product development. Before joining Aluminum Industries, Mr. Roshirt was executive vice president and director of Bohn Aluminum & Brass Corp., Detroit, and associated with that company for 34 years.

Trailmobile Inc., Cincinnati, appointed **Harry Eyler** vice president of sales and **James J. Black** vice president of engineering. Mr. Eyler has been general sales manager, and Mr. Black chief engineer.

James R. Russell is secretary of **Illinois Tool Works**, Chicago. He continues to occupy the position of assistant treasurer.

John V. Moran Jr. was appointed section head of the special publications section of **International Nickel Co. Inc.**, New York, succeeding the late **Edward C. Badeau.** Mr. Moran is editor of the company employee publication, *Pen and Inco*, and has been assistant to Mr. Badeau for two years. In addition he has supervised distribution of the company's motion pictures in the United States.

Philip M. Ginder was elected a vice president and **George F. Halfacre** was appointed manager of manufacturing, **New Jersey Zinc Co.**, New York. Mr. Ginder is also vice president of New Jersey Zinc Co. (of Pa.).

Joseph A. Grazier was elected acting president of **American Radiator & Standard Sanitary Corp.**, Pittsburgh, to serve as its chief executive officer. This action was taken because of the continued illness of **Theodore E. Mueller**, president of the corporation. Mr. Grazier was executive vice president.

Dow Chemical Co., Midland, Mich., elected as vice presidents **Dr. Ray H. Boundy**, a Dow director and director of research; **Donald Williams**, director of sales; and **Dr. J. D. Hanawalt**, manager of the magnesium department. **Dr. William R. Veazey**, long identified with research and administrative activities of the company, has retired after 37 years of service.

Colman Curtiss Jr. was appointed general sales manager, **Buffalo Bolt Co.**, North Tonawanda, N. Y.

Anderson Bros. Mfg. Co., Rockford, Ill., elected **Walter E. Gunnerson** vice president in charge of sales. Associated with the company for 27 years, he has served

W. E. BENNINGHOFF
. . . Ohio Crankshaft v. p.

EARL R. MOHR
. . . heads Storms Drop Forging Co.

HARVEY V. EASTLING
. . . new post with Link-Belt

for the last 15 years as sales manager and chief engineer.

W. E. Benninghoff was elected vice president of **Ohio Crankshaft Co.**, Cleveland, and continues as general manager of its Tocco Division. **Foster H. Pettay,** a vice president, assumes the additional post of secretary-treasurer. **C. H. Kimmel** was elected a director to succeed the late **Francis S. Denneen.** Mr. Kimmel is vice president-general manager of Ohio Crankshaft.

Fred Wehle Jr. was made manager of a newly created Georgia branch office in Atlanta for **E. F. Hauserman Co.**

F. L. Whitney becomes chief engineer, **Walter Kidde Constructors Inc.,** New York.

Storms Drop Forging Co., Springfield, Mass., promoted **Earl R. Mohr** from vice president to president and general manager. He has been vice president for the past year. Before joining the Springfield company, he was in charge of operations at Atwater Mfg. Co., Plantsville, Conn., for ten years.

Marvin V. Maxwell and **Harry H. Chapman** were made managers at Chicago for, respectively, the engineering and service department, and the electric utility department, northwestern district of **Westinghouse Electric Corp.**

Stuart L. Rich joined **Cazenovia Precision Machine Co. Inc.,** East Aurora, N. Y., as general manager. He was with Glowmeter Corp.

Link-Belt Co. appointed **Harvey V. Eastling** assistant general manager of its Pacific division with headquarters at San Francisco. He has been general sales manager there. **Donald E. Thal** was appointed sales manager, San Francisco plant.

Willis L. Winter was made distribution apparatus manager for **Westinghouse Electric Corp.'s** Pacific Coast district. He will have headquarters at San Francisco.

Walter A. Baumstark was appointed midwestern regional sales manager for **Carpenter Steel Co.'s** Alloy Tube Division, Union, N. J.

Carl J. Westling was appointed director of engineering, **Salem-Brosius Inc.,** Pittsburgh. Formerly chief engineer, he designed the new Brosium-Westling goggle-type plate valve, and the goggle-type plate valve now marketed by S. P. Kinney Co. and Kopper Co.'s Bartlett-Hayward Division.

John F. Kelley was elected treasurer, **Pullman-Standard Car Mfg. Co.,** Chicago.

Francis D. Skelley joined **Honan-Crane Corp.** as sales engineer for New Jersey with headquarters in the district warehouse in Ridgefield, N. J. He formerly served as sales manager, Standard Electronics Research Corp.

R. F. Asmussne, associated with **Clary Multiplier Corp.,** San Gabriel, Calif., for the last ten years, was appointed general manager of the aircraft hardware division.

David M. Petty was advanced from general foreman to superintendent, mechanical and electrical department of the South San Francisco plant of **Bethlehem Pacific Coast Steel Corp.**

Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford, Conn., appointed **Howard A. Small** cutting tool and gage sales engineer.

J. E. Smet was placed in charge of a new district office in Hartford, Conn., by **Allis-Chalmers Mfg. Co.'s** general machinery division. **F. S. Howard** succeeds Mr. Smet as manager at New Haven, Conn.

Firth Sterling Inc., Pittsburgh, appointed **Stuart A. Smith** Ohio district manager replacing **Macon Jordan,** resigned, and **James E. Gray** as assistant manager, carbide sales; **Lester N. Shannon Jr.** as district manager, Birmingham, replacing **C. E. Hughes,** resigned; and **R. O. Valoon** as Chicago district manager to replace **E. A. Carpenter,** resigned. The Chicago office and warehouse is now located at 3415 North Ave., Melrose Park, Ill.

T. S. Fuller was appointed consultant for the research and metallurgical departments of **Heppenstall Co.,** Pittsburgh. Mr. Fuller, who served as president of the American Society for Testing Materials in 1951-52, recently retired after 42 years' service with Gen-

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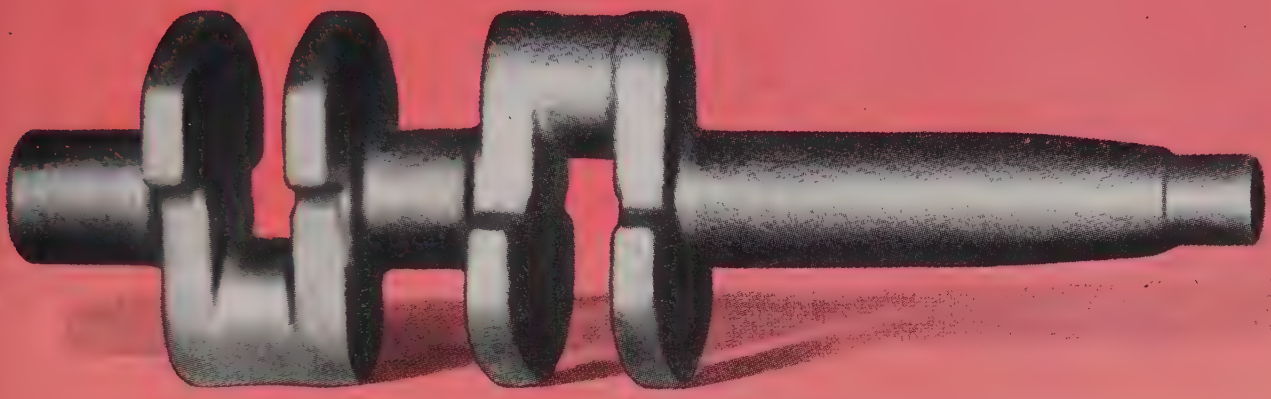

Forged outboard engine crankshaft weighs approx. 3 lbs.; final machining requires this part to be forged to exact tolerances . . . typical of T & W service for mass-producing forgings to meet the toughest requirements.

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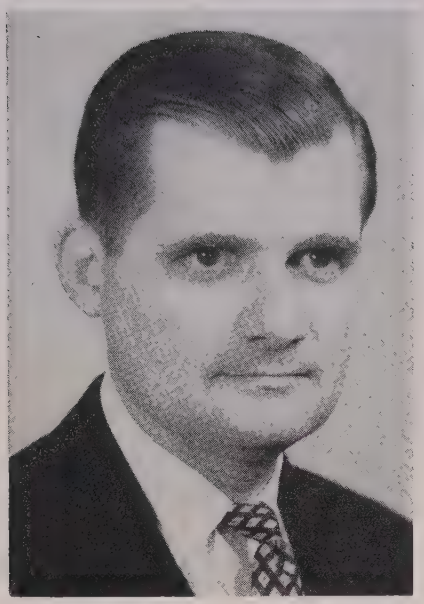
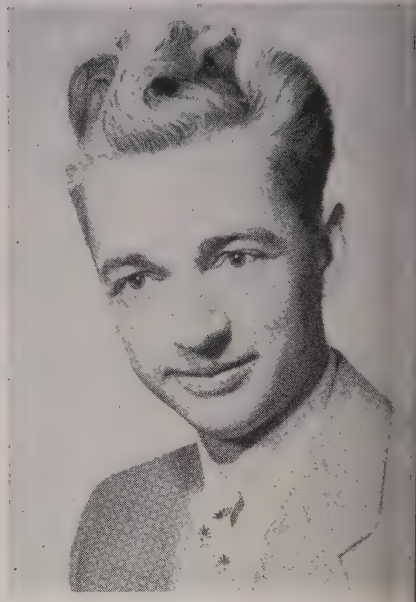


JACK H. COX
. . . product mgr. for Armco Drainage

SHERMAN W. SCHAUER
. . . sales post at Cincinnati Bickford Tool



KING DeSEVE
. . . Warner Electric mfg. mgr.

eral Electric Co. at Schenectady, N. Y.

Jack H. Cox was named manager, drainage and allied product sales, for **Armco Drainage & Metal Products Inc.**, subsidiary, Armco Steel Corp., Middletown, O.

Henney Motor Co. Inc., Freeport, Ill., appointed **Alan L. Higbie** as administrative assistant to the vice president. Prior to association with Henney in April, 1953, he served several years with Dodge Division, Chrysler Corp.

Siegfried Langner was made factory manager for the plant of the Stratos Division, **Fairchild Engine & Airplane Corp.**, Hagerstown, Md. Before joining Stratos he was plant manager, Lanston Monotype Machine Co.

Paul L. Hershfield, president, Mississippi Glass Co., was also elected president of its subsidiary, **Walsh Refractories Corp.**, St. Louis, replacing **J. L. Crawford**, resigned. Mr. Hershfield continues as board chairman of Walsh, an office he has occupied for several years. Other changes in the subsidiary company include **A. J. Tomasek**, formerly chief engineer, promoted to executive vice president; **John J. Duggan** made sales manager, glass refractories; and **W. K. Schweickhardt** sales manager, general refractories.

Carl J. Koelsch was elected vice president, **Fruehauf Trailer Co.**, Detroit.

Sherman W. Schauer was appointed assistant sales manager, **Cincinnati Bickford Tool Co.**, Cincinnati. He joined the company in 1946 after release from U. S. Army. Completing special mechanical training, he joined the sales department where he has been for the last several years.

Vendo Co., Kansas City, Mo., appointed **Arlo Hoover** to the newly created position of director of purchases. He retains the position of administrative assistant to the first vice president. **Donald R. Ross** continues as purchasing agent.

Frank E. Seery was made district sales manager, plate and welding division, **General American Transportation Corp.** He replaces **Ben K. Duffy** at Pittsburgh.

A. J. Gentholts, assistant counsel of **Republic Steel Corp.**, Cleveland, assumes the newly created position of executive assistant. He will represent Republic in legislative matters.

At the San Diego, Calif., division of **Consolidated Vultee Aircraft Corp.**, **A. W. Morgan**, Plant 1 works manager, was assigned as acting general manufacturing manager. He has direct authority over all manufacturing operations at both Plants 1 and 2, as well as flight, quality control, factory methods and work standards. **W. L. Young** is currently serving as acting works manager of Plant 1.

King DeSeve, formerly industri relations manager, **Warner Elec tric Brake & Clutch Co.**, Beloi Wis., was promoted to manage of manufacturing operations. Prio to joining the company in 1951, h was with Fairbanks-Morse Co. a assistant production manager.

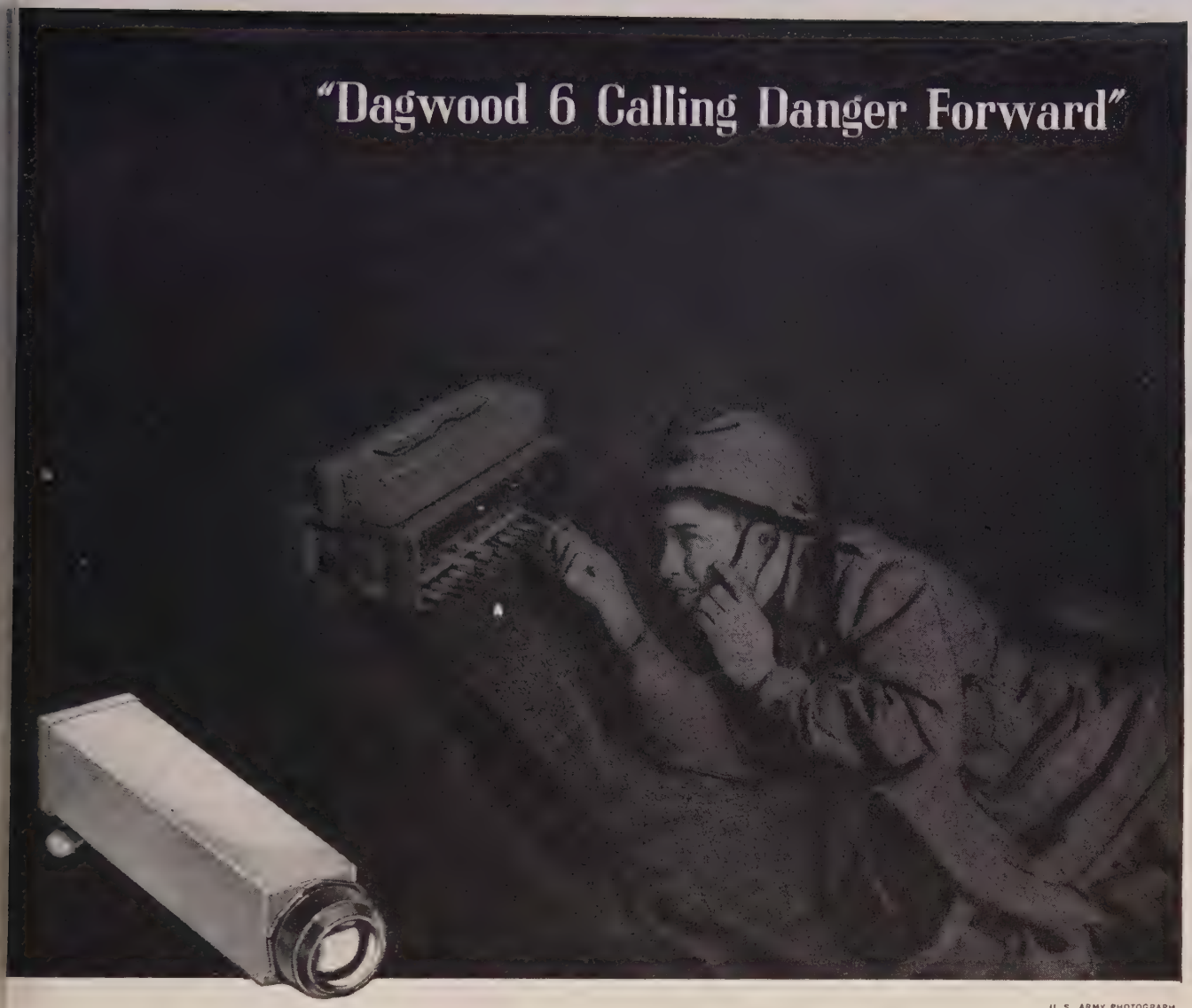
Eugene F. McCarthy was electe president, **Beals, McCarthy Rogers Inc.**, Buffalo. He succeed the late **J. Frederick Rogers.** M McCarthy was vice president. Ed **ward K. Hirsch** becomes vice pre ident-treasurer and **Paul W. Evan** vice president-secretary.

Edwin W. Shipman was elect vice president and manager of t licensee division of **Illinois To Works**, Chicago.

Knapp Mills Inc., Long Island Cit N. Y., elected **Harold E. Olson** a newly created post of executiv vice president of its subsidiar **Andrews-Knapp Construction C Inc.**

The following are appointments the Atlantic district of **Gener Electric Co.'s** apparatus sales div sion: **N. L. Whitecotton** manag of sales, **R. M. Bleak** manager marketing research, **E. G. S. Ma well** manager of apparatus produ sales, **C. L. Davison** manager industry sales and **H. W. Robins** manager of agency and distrib tor sales. Concurrently, **W. Henn** replaces Mr. Whitecotton manager of the Philadelphia offic **W. C. Mason** succeeds Mr. Henn manager, electric utility sales f

"Dagwood 6 Calling Danger Forward"



U. S. ARMY PHOTOGRAPH

G.I. Joe now puts his calls through a new field switchboard twice the capacity and one-third the size of the one toted by his World War II counterpart.

The new "board" has a constitution that can winter in Rejkjavik, summer in Mombasa, and roll with a punch . . . just in case travel gets rough. Its retractable cords know when to come in out of the rain and goo.

Among the many essential parts of this instrument there is one named simply "SIGNAL, switchboard." It is a luminous-painted signal, operated by an electro-magnet, which "drops" into view when a line is calling. There's one "drop" for each telephone cord circuit; each drop is enclosed in a square housing made from Superior Hard Drawn Carbon Steel AISI C1008—.6815" I.D. Square, .020" wall, 2.656" long. Tolerances are close—±.005" on the length and +.007",—.000" on width.

Mr. Lloyd Bender, Vice President of The North Electric Manufacturing Company, makers of the switchboard, says of Superior, "Your performance has been excellent—in workmanship, quality of material and delivery."

Are you looking for a good small-tubing source—one that gives you the widest choice of tubing analyses available in America today, one that can supply you with one or one-million feet, one known for its uniformly high quality, and its interest in you and your tube problems? Try Superior. Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

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All analyses .010" to 5/8" O.D.
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You'd be amazed (as we are sometimes) at the long memories possessed by some of our furnace engineers. On short notice they'll give you the serial number, location and performance data on furnaces that we installed as long as 10 or 15 years ago — and they're generally right. The point is, the best way to forecast the performance of a furnace not yet built is to check thoroughly the records of similar installations.

BASED ON 22 YEARS OF "HINDSIGHT"

We have built hundreds of gas carburizers for all types of production requirements. If you are interested in continuous gas carburizing for instance, we can point to the first installation of its kind in 1931. It's still doing a job as reported in our sixteen-page bulletin, SC-134, an important and valuable review of gas carburizing techniques and possibilities. Write for it, on your letterhead please.

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bulletins

SC-134	Modern Gas Carburizing
SC-158	RX Prepared Atmosphere Generator
SC-155	Prepared Gas Atmospheres
SC-149	Pit Type Controlled Atmosphere Furnaces
SC-147	Rotary Retort Controlled Atmosphere Furnaces

reprints

53-A	Pit Type Carburizing Furnaces Provide Flexible Setup
52-C	Continuous Carbon Restoration Furnace Boosts Production
49-E	Furnaces for Gas Carburizing
49-B	Homogeneous Carburizing
47-E	Influence of Water Vapor on Gas Carburizing Atmospheres

Surface
HEAT TREATING EQUIPMENT

EDWARD N. CHILSON
. . . chairman of J. G. White Engineering

GEORGE C. MILLER
. . . heads Bakelite Co.

Philadelphia, **C. R. Stouch** was named to Mr. Maxwell's position as manager, Charleston, W. Va., office and **E. A. Rohana** was appointed auditor, Baltimore office.

Edward N. Chilson, vice president, J. G. White Engineering Corp., New York, and a director of the organization since it was incorporated in 1913, was elected chairman of the board. Others elected are **Ford Kurtz** as president, **Harold P. Jackson** as vice president in charge of construction and **Robert H. Barclay** as vice president, engineering.

Louis W. Adams Jr. was appointed technical sales representative for the pig iron division of **Pittsburgh Coke & Chemical Co.**, Pittsburgh.

R. E. Sheffer replaces **Harry C. Slagle** as manager of **Aluminum Co. of America's** Chicago Works. Mr. Slagle transfers to Pittsburgh as manager of Alcoa's shop training program.

George C. Miller was named president of **Bakelite Co.,** a division of Union Carbide & Carbon Corp., New York. He succeeds **H. S. Bunn,** vice president of Union Carbide, who now succeeds the late **J. W. McLaughlin** as chairman of Bakelite and as a member of Union Carbide's appropriations committee.

Clifford J. Alpaugh was named to the newly created post of director of purchases, **Bohn Aluminum & Brass Corp.,** Detroit. He had been purchasing director for Federal Telephone & Radio Corp.

E. C. Clark, assistant director, research and engineering department, was appointed director of operations at **Air Reduction Sales Co.,** division of Air Reduction Co. Inc., New York.

L. E. Howard Jr. was elected secretary-treasurer and director of **American Pipe & Steel Corp.,** Alhambra, Calif. **Carl B. Dahlberg,** previously secretary and sales manager of the company, was elected a director and vice president in charge of sales. Elected vice president in charge of production and engineering administration is **Rear Adm. R. A. J. English** U. S. N. (ret.)

Lloyd W. Jeffries is now general sales manager of both **Valvair Corp.** and its affiliate, Sinclair-Collins Valve Co., both in Akron. He succeeds **Kenneth E. Knotts,** who becomes sales representative for Valvair in metropolitan New York and northern New Jersey.

Henry Ervin was elected vice president—director of sales of **American Chain & Cable Co. Inc.** and associated companies. Sales activities of the 16 divisions will be under his direction from headquarters in New York. **Harry Williams** was elected a vice president with headquarters in Detroit, continuing as supervisor of automotive and aircraft division sales.

Charles F. Hauck was made sales manager, chemical plants division, **Blaw-Knox Co.,** Pittsburgh. He is succeeded as assistant sales manager by **Bruce Alexander.**

Eric G. Peterson was appointed executive vice president, **Peabody Engineering Co.,** New York. His new assignment now embraces all phases of research and engineering, production and sales.

Marquardt Aircraft Co., Van Nuys, Calif., appointed **Charles Sandlin** manager of production control, **Junius A. Holte** chief tool engineer and **Donald P. Frankel** assistant director of customer relations.

Minier Sargent is secretary of **Caterpillar Tractor Co.,** Peoria, Ill.

OBITUARIES...

Arthur J. Tuscany, 59, president of **Arthur J. Tuscany Organization,** Cleveland, association management firm, died June 5. He was executive secretary of several associations connected with the metalworking industry.

William H. Maul, owner of **Maul Mfg. Co.,** Farmington, Mich., died May 30.

Edward C. Badeau, section head of the special publications section of **International Nickel Co. Inc.,** New York, and editor of *Inco* magazine, died May 24.

Samuel H. Jasper, 62, long associated with **Penton Publishing Co.,** Cleveland, died June 8. He entered the company's employ in 1907 and in 1911 became business manager at Pittsburgh for company publications which included *Foundry* and *Iron Trade Review* (predecessor of STEEL). Because of illness, Mr. Jasper retired in 1942.

A. B. Sloan, 70, retired vice president-sales, **Northwestern Steel & Wire Co.,** Sterling, Ill., died June 4. Following retirement in 1950, he had continued with the company on a part-time basis and was its representative in Arkansas.

Orville A. Tucker, 56, vice president, **Pacific Car & Foundry Co.,** Seattle, died June 1.

CF&I's Growth Brings Diversity

Western steelmaker broadens its range of products by effective use of funds. Now nation's ninth-largest steel producer, CF&I acquires valuable eastern companies

GROWTH of Colorado Fuel & Iron Corp., Denver, with a doubling of its ingot capacity in little more than a decade to become the ninth-largest steel producer in the United States, constitutes an interesting record of increasing diversity of products, geographical locations of properties and effective utilization of funds in providing improvements and expansion.

Development in this period has been marked by consolidations, which have included notably the acquisition of the Wickwire Spencer Steel Co., New York, with various plants in the East, in October, 1945; Worth Steel Co., Claymont, Del., in March, 1951; E. & G. Brooke Iron Co., Birdsboro, Pa., with its mining subsidiary, Richard Ore Co., Wharton, N. J., in January, 1952; and John A. Roebling's Sons Co., Trenton and Roebling, N. J., Dec. 31, 1952.

Heading East—All of these acquired companies have their roots in the East, and have tended to give balance, geographically, to a company that had its origin in the West. They have added diversity of products, as well as size, to a producer which at one time devoted 70 per cent of its steel output to rails and accessories against its 15 per cent today. CF&I now has 12 plants in seven states.

Plants of Wickwire Spencer produce many special types of wire, industrial screens, wire rope, insect cloth, springs and mechanical specialties. Worth has provided carbon, alloy and stainless-clad plates; flanged and dished heads; and large diameter transmission pipe. Brooke has added to ore reserves and has provided an assured supply of pig iron for the corporation's expanding Claymont operation, as well as tonnage for outside sales.

Additional Products—The Roebling plants are adding various products, including cold-rolled strip, a broad line of electrical wire and cable, bridge construction products and services, new types of wire rope, strand and various specialties, as well as supplementing, to some extent, the corporation's own line of wire products.

CF&I has not only increased production of its principal product groups, but has added new items such as grader blades and cutting edges, grinding balls, rock bolts, special types of wire, coiled baling wire and others. Early this fall it will get into production on seamless casing and tubing at its new $27,720,000 mill in Pueblo, Colo., the first of its type in the West.

Rapid Rise—Within 11 years the corporation has increased its rated ingot capacity from 1,119,600 net tons to 2,220,000 tons as of Jan. 1, 1953, of which 1,485,000 tons are at Pueblo, 495,000 tons at Claymont, and 240,000 tons at Buffalo. Now it has added 205,000 tons at Roebling, bringing the total to 2,425,000 tons.

During that period pig iron capacity has been increased at Pueblo from 630,560 tons to 960,000 tons, as of Jan. 1 this year. Buffalo's capacity has been stepped up to 430,000 tons, and with the additional capacity of 160,000 tons acquired at Birdsboro, CF&I now has a total pig iron capacity of 1,550,000 tons. Coking operations at Pueblo have an annual capacity of 1,220,000 tons.

Enlargement—When Charles Allen Jr. and associates assumed control in the fall of 1945, expansion and modernization became accelerated. During the five-year period from July 1, 1947, through June 30 of last year, approximately $46,638,000 was spent by the corporation and its subsidiaries (including Claymont from March 5, 1951, and Brooke from Jan. 15, 1952) for improvements and additions and acquisition of property. Approximately $33 million was spent in the Colorado Division and The California Wire Cloth Corp., and $13 million in the Wickwire Spencer Steel Division and the American Wire Fabrics Corp.

In addition to this program, further work is under contemplation.

A. F. FRANZ
. . . president of CF&I

A. F. Franz, CF&I president, estimates that $3 million will be spent on Roebling properties this year including tempering and patenting furnaces. He says Roebling's biggest year in sales prior to acquisition by CF&I was $66 million; he expects sales in 1953 to total $7[illegible] million. Sales in March amounted to $7.2 million and in February to $6 million.

Changes Made — At Claymont the corporation has now spent $[illegible] million, against a $6 million program, which includes the modernization of two plate mills by the installation of a vertical edging mill, electric driven slab shear and slab pilers, new heat treating furnaces, extension of feed tables, soaking pits, and other improvements to the plate specialty and pipe operations.

Much of the work of modernization of the plate mills has been completed, and according to Mr. Franz, the new soaking pits will be put in use this summer. He estimates current stainless clad capacity at 250 to 300 tons a month with expansion in prospect.

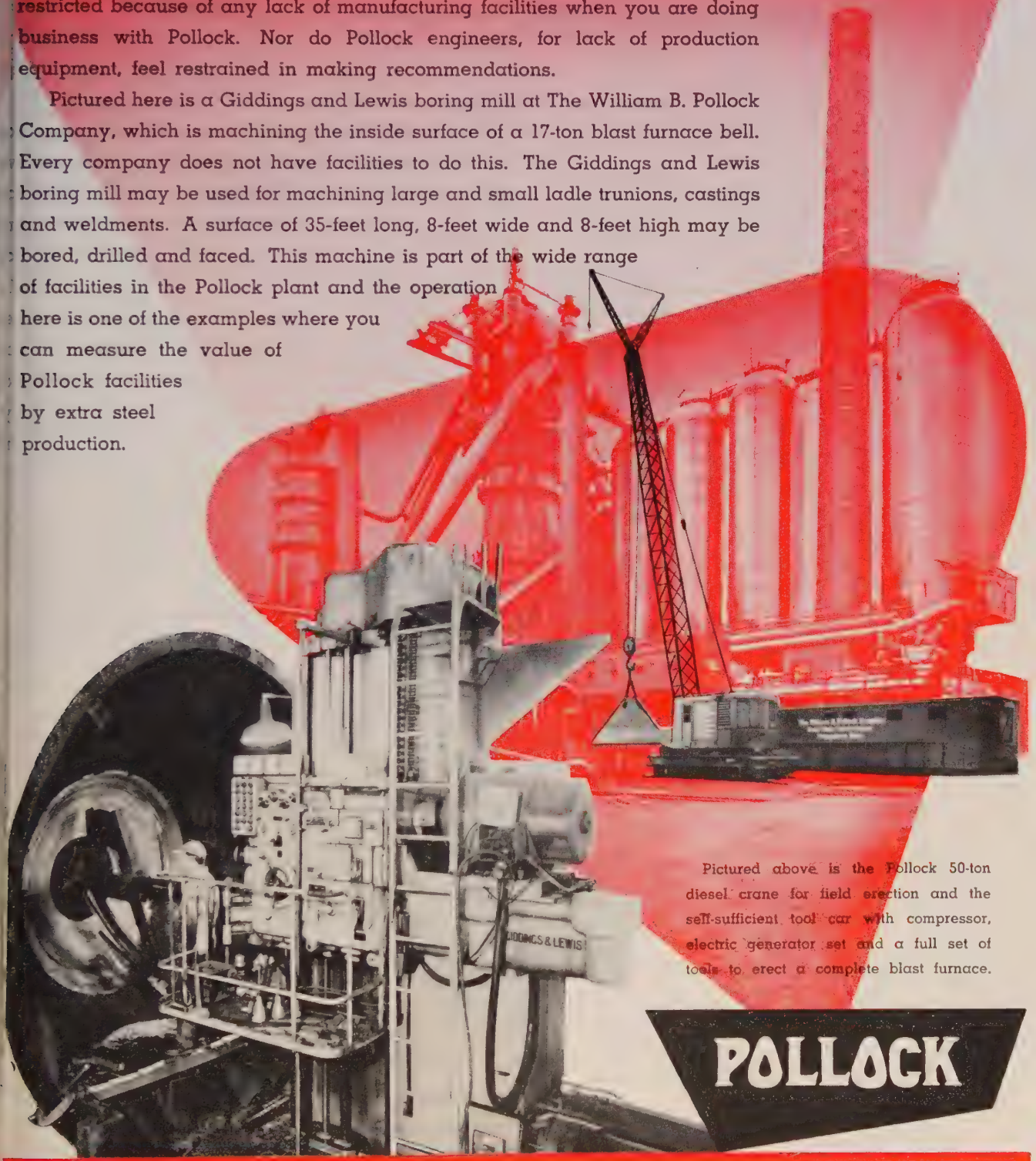
Plans for a blast furnace in Claymont are still nebulous.

Building Plans—Mr. Franz says the Brooke furnace will be rebuilt this fall. This furnace, with an annual capacity of 151,200 tons, relies on the Richard mine for about one-third to one-half of its ore requirements. Indicative of its intention to develop and keep a ce[illegible]

POLLOCK facilities encourage higher specification standards in steel construction

Your progressive ideas for blast furnaces and steel plants are not restricted because of any lack of manufacturing facilities when you are doing business with Pollock. Nor do Pollock engineers, for lack of production equipment, feel restrained in making recommendations.

Pictured here is a Giddings and Lewis boring mill at The William B. Pollock Company, which is machining the inside surface of a 17-ton blast furnace bell. Every company does not have facilities to do this. The Giddings and Lewis boring mill may be used for machining large and small ladle trunions, castings and weldments. A surface of 35-feet long, 8-feet wide and 8-feet high may be bored, drilled and faced. This machine is part of the wide range of facilities in the Pollock plant and the operation here is one of the examples where you can measure the value of Pollock facilities by extra steel production.



Pictured above is the Pollock 50-ton diesel crane for field erection and the self-sufficient tool car with compressor, electric generator set and a full set of tools to erect a complete blast furnace.

POLLOCK

THE WILLIAM B. POLLOCK COMPANY • YOUNGSTOWN, OHIO

STEEL PLATE CONSTRUCTION . ENGINEERS . FABRICATORS . ERECTORS

BLAST FURNACES • HOT METAL CARS AND LADLES • CINDER AND SLAG CARS • INGOT MOULD CARS • CHARGING BOX CARS • WELDED OPEN HEARTH LADLES

tain amount of merchant pig iron business, CF&I last fall entered into a two-year contract to supply Lukens Steel Co., Coatesville, Pa., with a substantial amount of iron, although it was obvious that it would have to look to outside sources for some of its eastern requirements. Actually, the corporation later bought 60,000 tons of Australian iron, primarily for Claymont, with possibly a quarter of the amount already having been received.

The corporation has been helped at Claymont by the shipping of some of its own iron from Pueblo, a trend that may be accelerated to some extent by recent reduction of $4 a ton in the freight rate from that point (such reduction also has been allowed on wire rods from Pueblo to the East).

Ingot Setup—In recent months, additional open-hearth improvements have brought an increase of 33 per cent in ingot production at Pueblo. These have included new cranes, dump cars, slag pots and other equipment.

Recent expenditures have included a new coal washery at Pueblo and the redesigning and relining of blast furnaces there and at Buffalo. An additional 160 acres have been purchased adjacent to the Buffalo plant, bringing the company's holdings there up to around 550 acres. The property there has a 5600-foot frontage along the Niagara river, which should prove particularly valuable when, and if, the St. Lawrence Seaway is developed. The company is getting ore at Buffalo from the Mesabi range at around 20 cents a unit, but contemplates getting ore from Canada eventually.

Revamping — Facilities at Oakland and South San Francisco, Calif., have been completely redesigned. The Mt. Wolf, Pa., plant, one of the largest producers of insect screen cloth in the country, has been modernized. New wire and wire rope equipment has been installed at Palmer, Mass. Some improvements have been made at Clinton and Worcester, Mass.

Mr. Franz regards his corporation's "break even" point at 80 to 85 per cent. However, he anticipates high operations throughout the remainder of the year. Some falling off may develop in automotive demand, but nothing drastic, he believes. CF&I earnings, he estimates, will be $3 a share for the year ending June 30, 1953.

Diehl Heads Association

Richard C. Diehl, president, Chase Brass & Copper Co. Inc., Waterbury, Conn., was elected president of Copper & Brass Research Association, New York. He succeeds William M. Goss, executive vice president, Scovill Mfg. Co., Waterbury.

Mr. Diehl became president of Chase, a subsidiary of Kennecott Copper Corp., Sept. 22, 1950. Prior

RICHARD C. DIEHL

to becoming president of Chase, Mr. Diehl spent his entire career in the steel industry. He spent seven years with Armco Steel Corp. at its Butler, Pa., and Middletown, O., plants. He then went to Wheeling Steel Corp. where he was employed for 15 years, resigning as general manager of its Steubenville, O., plant to become president of Chase.

T. E. Veltfort was re-elected manager and Bertram B. Caddle was re-elected secretary of the association.

Electrical Firm Opens Factory

West Coast Electrical Mfg. Corp. moved into its new factory at 233 W. 116th Place, Los Angeles. The firm's old factory at S. Main and Century boulevard, Los Angeles, is being used exclusively for manufacture of solenoids.

Milwaukee Firms Expand

Howard Foundry and S & M Mfg. buy buildings to expand their operations

HOWARD FOUNDRY CO., Chicago, purchased a building at 51[illegible] N. 33rd St., Milwaukee, for use as a permanent location for its I[illegible] vestment Casting Division in the city. The building and land, costing about $250,000, were purchased from S & M Mfg. Co., Milwaukee a steel fabricating firm. The deal will permit both of these companies to expand operations.

K. J. Yonker, manager, Investment Casting Division, says the move is expected to double the division's Milwaukee output of precision castings used chiefly for aircraft components and turbines.

S & M Mfg. bought a building at 2901 W. Melrose St., Milwaukee which will be enlarged, allowing the company to consolidate all operations.

A mutually satisfactory program of staggered occupancy has been worked out to bring completion of moving about Nov. 1, says Harry Malm, president, S & M Mfg. Co.

Dean Steel Opens New Quarters

Olney J. Dean Steel Co. combined its general office and fabricating shop in its new building at 933 E. 95th St., Chicago 19. James R. Martin is president of the firm.

Will Reconstruct Blast Furnace

A. E. Anderson Corp., Buffalo, is sending 10 experts to Sweden soon to supervise reconstruction of a blast furnace. The Buffalo concern was selected by Bofors Co. for the $750,000 job at its plant in Lulea, near the Arctic Circle. Firebrick for relining is not available in Sweden and will have to be imported.

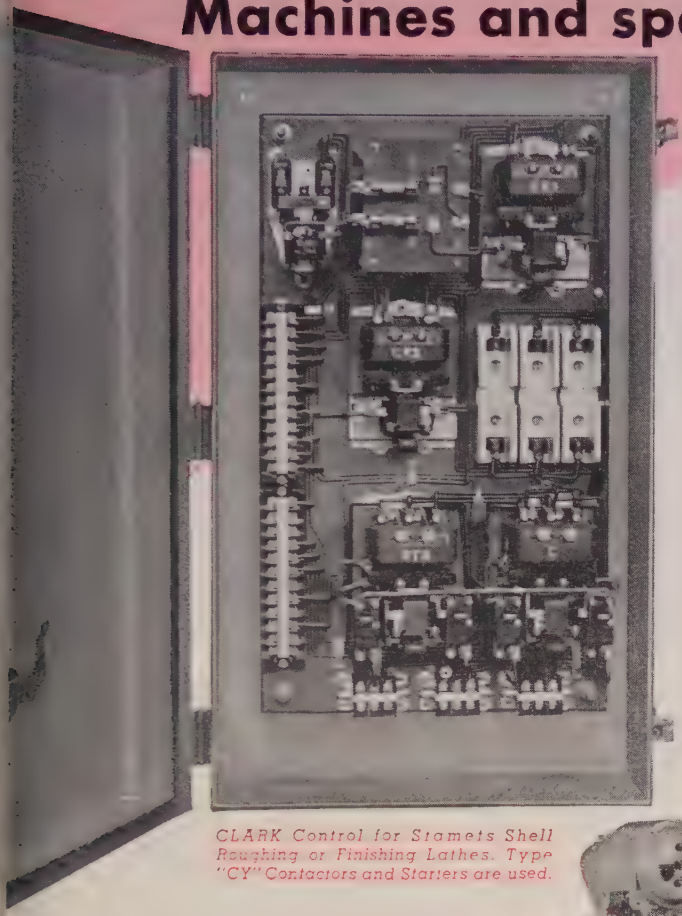
Automatic Methods Inc. Moves

Automatic Methods Inc., Newark, N. J., manufacturer of precision parts for aircraft and of lead screw tapping attachments, is moving all of its operations to Elizabeth, N. J. The new plant at 9[illegible] W. Grand St. will combine all operations of three plants formerly

(*Please turn to Page* 83)

CLARK TYPE "CY" STARTERS

efficiently control STAMETS Heavy-Duty Machines and speed shell production!



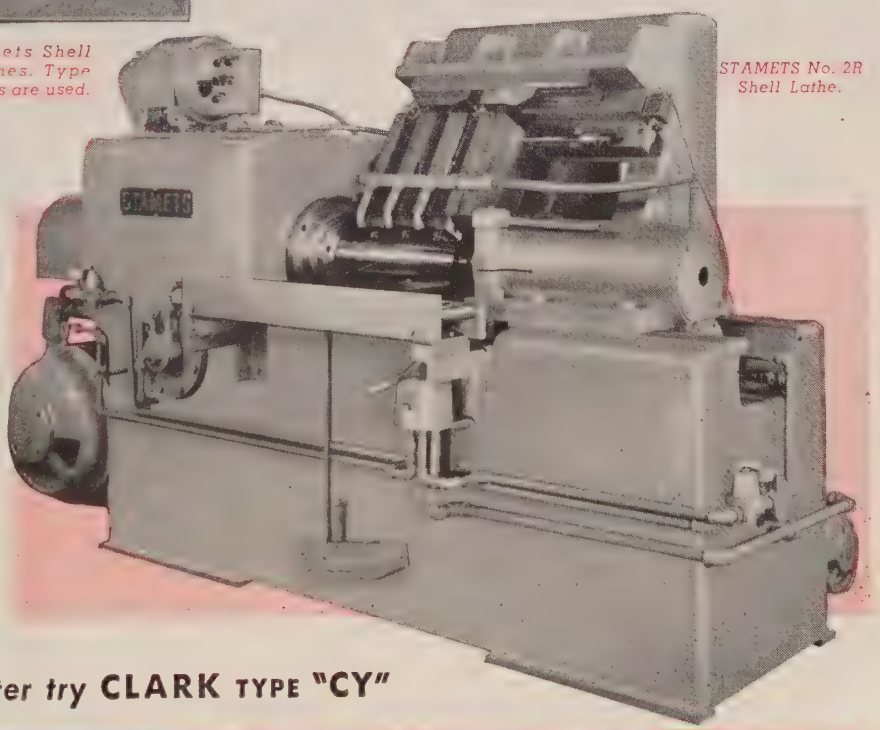
CLARK Control for Stamets Shell Roughing or Finishing Lathes. Type "CY" Contactors and Starters are used.

In several plants, Wm. K. Stamets No. 2R Shell Cut-Off machines, and Shell Lathes are producing 105 MM and 155 MM shells at a high rate.

Three types of machines, all with CLARK CONTROL, are used in each production line. A cut-off machine faces the solid end of the forging and cuts off the open end to the required length. The Roughing Lathe roughs out the shell, and the Finishing Lathe gives the shell its final contour and finish.

Depending on the size of the shells, and the optimum cutting speeds, the cut-off machines turn out 34 to 60 shells per hour.

While not completely automatic, the entire process is greatly simplified, loading and unloading, cutting off and turning of the shells is accomplished with a Foot Pedal, a "start" push button, and motion is stopped by a Limit Switch.



STAMETS No. 2R Shell Lathe.

Desirable cushioned stopping of the roughing spindle motor is accomplished by using current limiting resistance in the reverse plugging circuit. Smooth fast stopping, with no shock to the machine and no interference with production rate results.

Clark Type "CY" Starters and Relays controlling the Finishing Spindles provide completely satisfactory service.

Machine tool control problems are easily solved when CLARK TYPE "CY" equipment is used.

You'd better try **CLARK TYPE "CY"**

THE CLARK CONTROLLER CO.

ENGINEERED ELECTRICAL CONTROL • 1146 EAST 152ND STREET, CLEVELAND 10, OHIO

STANDARDS and SPECIALS by the Millions

THE FERRY CAP & SET SCREW CO.

2159 SCRANTON ROAD • • • CLEVELAND 13, OHIO

"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 95,000-110,000 p.s.i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.

"LO-CARBS"

Made of AISI C-1018 steel—bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength 75,000-95,000 p.s.i. Carried in stock.

SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications—hexagon head hard; polished if specified — threads soft to close tolerance—points machine turned; flat and chamfered.

CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

STANDARDS carried by LEADING DISTRIBUTORS

* **SPECIALS** furnished to BLUE PRINT SPECIFICATIONS

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(*Continued from Page* 80)

ating in Newark. Full scale operations are expected to start by ly 15.

oundry Extends Product Line

Cooper Alloy Foundry Co., Hillde, N. J., producer of corrosion esistant alloys, extended its prodct line to include plastic pumps, alves, accessories and fittings. he firm has acquired interest in anton Pump Corp., Empire State uilding, New York, producer of lastic pumps, polyethylene valves nd fittings.

ouston Plant Makes Beer Cans

Continental Can Co., New York, nstalled a 15th production line h its Houston plant to produce at-top beer cans at a rate of 60 illion a year. Formerly, Contintal shipped beer cans into Texas rom St. Louis and Chicago.

Binks Opens Branch Office

Binks Mfg. Co., Chicago, maker f spray painting equipment, pened a branch sales office and arehouse at 950 Newhall St., San rancisco. Richard P. Rossi heads he new office.

Aircraft Armaments To Build

Aircraft Armaments Inc., Baltiore, has let a contract for conruction of a plant. Work is exected to get under way late this ummer. The plant will contain 60,000 sq ft and will be built on a 26-acre site at Texas, Baltimore county, Md. Joel M. Jacobsen is vice president and general manager of the company which is a subsidiary of Hayes Manufacturing Co., Grand Rapids, Mich., maker of automobile bodies and accessories.

Jacques Brass Expanding

Jacques Brass Specialties Inc., Baltimore, manufacturer of machine parts and components for aircraft, is investing about $75,000 in new equipment. The company occupies about 15,000 sq ft and is planning the erection of a plant, at a site not yet determined, to contain some 30,000 sq ft. William Stanton is president.

Rockwell Shifts Production

Rockwell Mfg. Co., Pittsburgh, is transferring all of its gas industry instrument production from that city to its Macnick Division plant in Tulsa, Okla. There will be no physical expansion of facilities at Tulsa, but some machinery is being moved there from Pittsburgh and additional employees will be hired. General manager of the Macnick Division is W. M. Connor.

Stampings Firm Leases Space

Eastern Venetian Blind Co., Baltimore, manufacturer of venetian blinds and engaged in various types of metal stampings, has leased 15,000 sq ft at 1020 W. Pratt St., that city, for light manufacturing and storage. Harry S. Rosenbaum is president.

Allis-Chalmers Names Agents

Allis-Chalmers Mfg. Co., Milwaukee, appointed: Stevens Equipment Co. Inc., Salem, Oreg., as distributor for its motors, controls and drive equipment; Thermal Supply Co., Houston, as distributor of its motors, controls and pumps.

GE To Expand Departments

General Electric Co., Schenectady, N. Y., will transfer its welding department from Fitchburg, Mass., to York, Pa., by the end of 1954. The department will move into a vacated company plant which will allow room for necessary manufacturing expansion. The plant formerly housed GE's Wire & Cable Division, which is being moved to two New England cities. The company's small turbine and supercharger department will remain in Fitchburg where it can now expand.

Steel Firm Changes Name

Jessop Steel Co. Ltd., Toronto, Ont., changed its name to Jessop Steel of Canada Ltd. Frank B. Rackley, president of the parent company in Washington, Pa., was re-elected chairman of the board of the Canadian firm. Other officers are: Charles E. Rice, presi-

Presto! From Tool Storage to B-47 Production

These two views of the main production building at the Georgia Division, Lockheed Aircraft Corp., at Marietta emphasize the growing might of the defense production program. Two years ago, as shown at left, the plant was only a warehouse for surplus machine tools. Now, as shown at right, final assembly line is "on schedule"

dent; F. B. Turner, secretary and assistant treasurer; W. C. Stumpf, treasurer and assistant secretary.

Arundel Chemical Builds Plant

Arundel Chemical Corp. has resumed work on the erection of a new plant on Ordnance road, Baltimore. The company will make metal salts, including copper sulphate. An office and laboratory building is about completed. Manufacturing operations are expected to get under way in a few weeks. Samuel Schwartz is president.

Industrial Firms Merge

National Cylinder Gas Co., Chicago, merged with Girdler Corp., Louisville, Ky. Name of the surviving corporation is National Cylinder Gas Co., while Girdler is now operating as a division under the name of Girdler Co. Tube Turns Inc., Louisville, previously jointly owned by National Cylinder and Girder, is being operated as a wholly-owned subsidiary. Charles J. Haines, president of National Cylinder, continues as president of the surviving company while George O. Boomer, president of Gridler, is chairman of the executive committee.

Expands Electronics Division

Westinghouse Electric Corp., Pittsburgh, is expanding the engineering facilities of its Electronics Division in Baltimore. The engineering subdivision will be known as "Guided Missile Ground Control Engineering." It will concern itself exclusively with the development, design and manufacture of models and equipment for guidance of high-speed, high-altitude missiles.

Opens Factory Abroad

Hydraulic Press Mfg. Co., Mt. Gilead, O., established a manufacturing center abroad which will produce the firm's full line of equipment for distribution in western Europe and other territories. Products include hydraulic presses for metalworking and process industries, plastic molding presses and die casting machines. The new wholly-owned subsidiary is Hydraulische Pers Maatschappij Nederland, N. V., with headquarters at 558 Keizersgracht, Amsterdam, Netherlands. Manufacturing facilities have been established with Gebr Stork & Co., N. V., Hengelo, Netherlands.

Taco-West Corp. Changes Name

Taco-West Corp., Chicago, manufacturer of precision temperature controllers, changed its name to West Instrument Corp.

Tool Firms Consolidate

Acme Fishing Tool Co., Parkersburg, W. Va., was consolidated with Stardrill-Keystone Co. This combination brings together two of the oldest companies in the drilling industry, the latter dating back to 1878 and Acme having been founded in 1900. Acme Fishing Tool Co. will be operated as a division of Stardrill-Keystone.

Computer Division Moves

Bendix Aviation Corp., Detroit, moved its Computer Division into larger quarters at 5630 Arbor Vitae St., Los Angeles. The division is developing a computer and expects to have a product on the market before the end of 1953.

Tests Plane Structures

Consolidated Vultee Aircraft Corp. is operating a $369,000 static test facility at its San Diego Division. Hydraulic loading jacks, shown above, are attached through whiffletrees and tension pads to wing surface. Test results are recorded on equipment installed in a small, separate building

Tractor Plant Planned

Caterpillar Tractor Co. will construct plant and enlarge established facilities

MOTOR graders and industrial wheel tractors will be produced in a plant to be built by Caterpillar Tractor Co., Peoria, Ill. Location has not yet been selected. This project will be undertaken to accommodate at Peoria a broadened program of crawler tractor and diesel engine manufacture.

Enlargement and rearrangement of manufacturing facilities, as well as construction of the new plant, are expected to be completed by the end of 1955, says Louis B. Neumiller, president.

Total cost of new machinery and equipment at all plants, and of land and buildings under the new projects is estimated at about $45 million.

Sylvania Plans Expansion

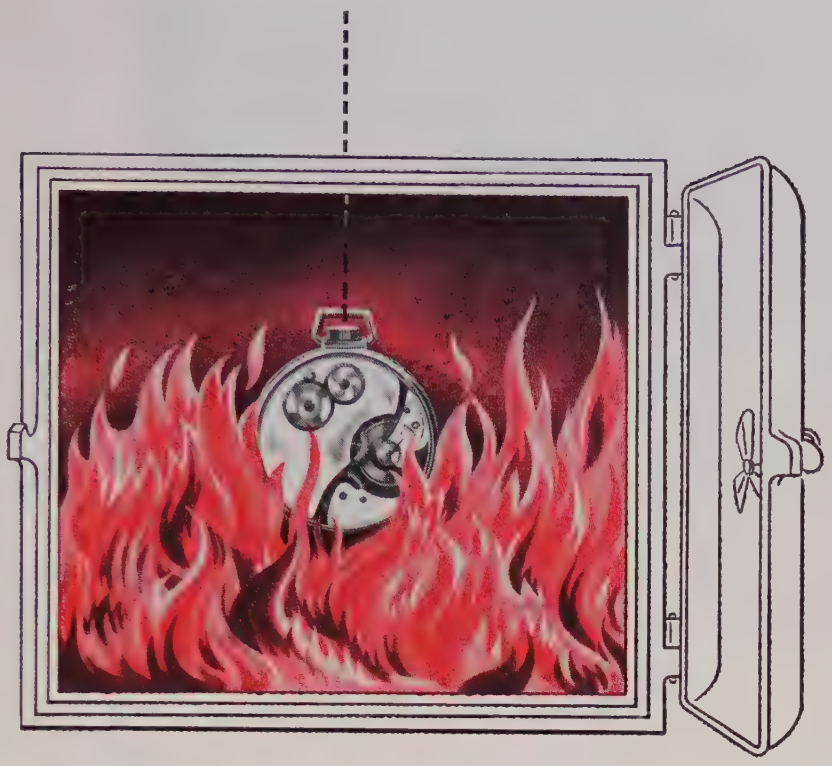
Sylvania Electric Products Inc., New York, is negotiating for purchase of approximately 15 acres of property in St. Marys, Pa., according to Robert G. Morgan, manager of the Sylvania plant there. The land is expected to be used for erection of warehouse facilities. It was reported that Sylvania also has been considering erection of additional manufacturing facilities at St. Marys.

Kohn To Triple Production

Kohn Engineering Corp. moved to its new plant located at 883 S. Telegraph Rd., Taylor Center, Mich. The plant has about 12,000 sq ft of space and will be used in the manufacturing and assembly of screw machine products for the automotive, aircraft and electrical fields. The firm expects to triple its output within 90 days.

Elkro Appoints Representatives

Elkro Co., Dayton, O., appointed the following representatives who will have exclusive sales rights on Velsey granite surface plates and Elkro heavy duty industrial stands in their respective territories: A. G. Cardineau & Co., West Englewood, N. J.; Kenneth H. Crosby Co., West Newton, Mass.; Ellis Schuerer Sales, Milwaukee; Thomas R. Michael Co., Pittsburgh;



Want to "hang a Watch" in a Furnace...and make it run?

Something as technically difficult *is* being done now. For instance, the "buckets" (paddles) and turbine rotor assemblies we make for aircraft jet engines.

These buckets have to stand up against 10,000 revolutions a minute and a flame 1400° hot. Yet, they are made to closer tolerances than many of the parts in your watch and your automobile.

To accomplish this, the Jet Division developed a special technique to finish-forge unusual tougher-than-steel alloys to accurate curves even smoother than glass...with no final machining required! And we helped develop the alloys.

You're probably planning a new product . . . or how to make a present one better, stronger, at lower cost. *Now is the time to call on the Jet Division for recommendations and technical advice.*

We offer you our experience in making more jet-engine "buckets" and turbine rotors than any other producer.

JET DIVISION

Thompson Products, Inc.

DEPARTMENT JP-6 • CLEVELAND 17, OHIO

Ford Ships New Medium Tank to Army

A Patton 48 medium tank is located at Ford Motor Co.'s Livonia, Mich., Tank Division plant for shipment to the Army field forces. The vehicles have passed rigid field tests and will be placed in service with tactical units. This is the first completely new medium tank developed by the Army since World War II. Ford has had the Patton 48 in production since April, 1952

Frank R. Johnston Co., Des Moines, Iowa; and Shop Supply Co., Birmingham.

Wabash Mfg. Plans Addition

Wabash Mfg. Co. Inc., Baltimore —machine work—will construct a 19,000-sq ft addition. The building will be located across the street from its present quarters. Joseph O. Danko is president.

Airsupply Moves Offices

Airsupply Co., a division of Garrett Corp., Los Angeles, is occupying enlarged quarters at 9815 Wilshire Blvd., Beverly Hills, Calif. Airsupply is an engineering and sales representative for eastern aircraft accessory manufacturers and for products of AiResearch Mfg. Co., Los Angeles, another of the Garrett divisions.

Richards & Conover To Build

Richards & Conover Hardware Co., Kansas City, Mo., will build an industrial steel warehouse and office structure at St. John and Bennington avenue, that city. This will represent expenditure of about $500,000, including land, buildings and equipment. The company will stock various types of steel, aluminum and copper sheets, bars, shapes and pipe. The present steel warehousing department will be devoted to expansion of the firm's hardware division. Carl Helms, former sales representative for United States Steel Co., is to manage the Richards & Conover warehouse.

Micromatic Hone Buys Demco

Micromatic Hone Corp., Detroit, machine tool producer, purchased Diesel Engineering & Mfg. Corp., Chicago, producer of fuel injectors, and will operate it as Micro-Precision Inc. as a wholly-owned subsidiary.

Stanley Aviation Expands

Stanley Aviation Corp., Buffalo, is erecting a $100,000 plant addition which will more than double the size of the largest unit in its group of buildings. The new unit will have 50,000 sq ft of floor space and is scheduled for completion in July. Stanley has a backlog of $7 million worth of defense orders.

Furnace Maker Changes Name

Gilbert S. Simonski Co., Neshaminy, Pa., producer of electric furnaces, changed its name to Lucifer Furnaces Inc. Officers of the company are: President, Clement Di... on; treasurer, Simon Fahrer; ge... eral manager, Anthony Lipsi. Pr... duction capacity will be boosted ... soon as plant expansion is co... pleted.

Western Spring Firms Organize...

Pacific Spring Manufacturers A... sociation was organized to esta... lish manufacturing standards a... to gain recognition of the indust... in the West. Officers are: Pre... dent, Gustav Schwarz, Conn... Spring Mfg. Co., San Francisc... vice president, O. D. Perkins, Holl... ter Coil Spring Mfg. Co., Los A... geles; secretary-treasurer, Willia... Glynn, Griffin Coil Spring Co. In... Los Angeles.

Seal Firms Exchange Rights

A mutual licensing agreeme... has been completed between Sea... Corp., Providence, R. I., and Fle... box Ltd., Manchester, England. U... der this agreement Sealol h... American and Canadian manufa... turing and sales rights to t... Flexibox seal. Flexibox Ltd. h... the same privileges with the Sea... seal for western Europe, Engla... and Australia. The Flexibox seal... used in the petroleum and pet... chemical industries; the Sealol m... chanical seals are used for d... ficult shaft sealing applications.

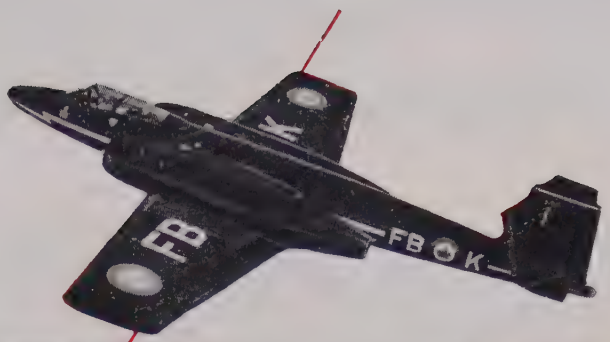
AMF Opens Chicago Branch

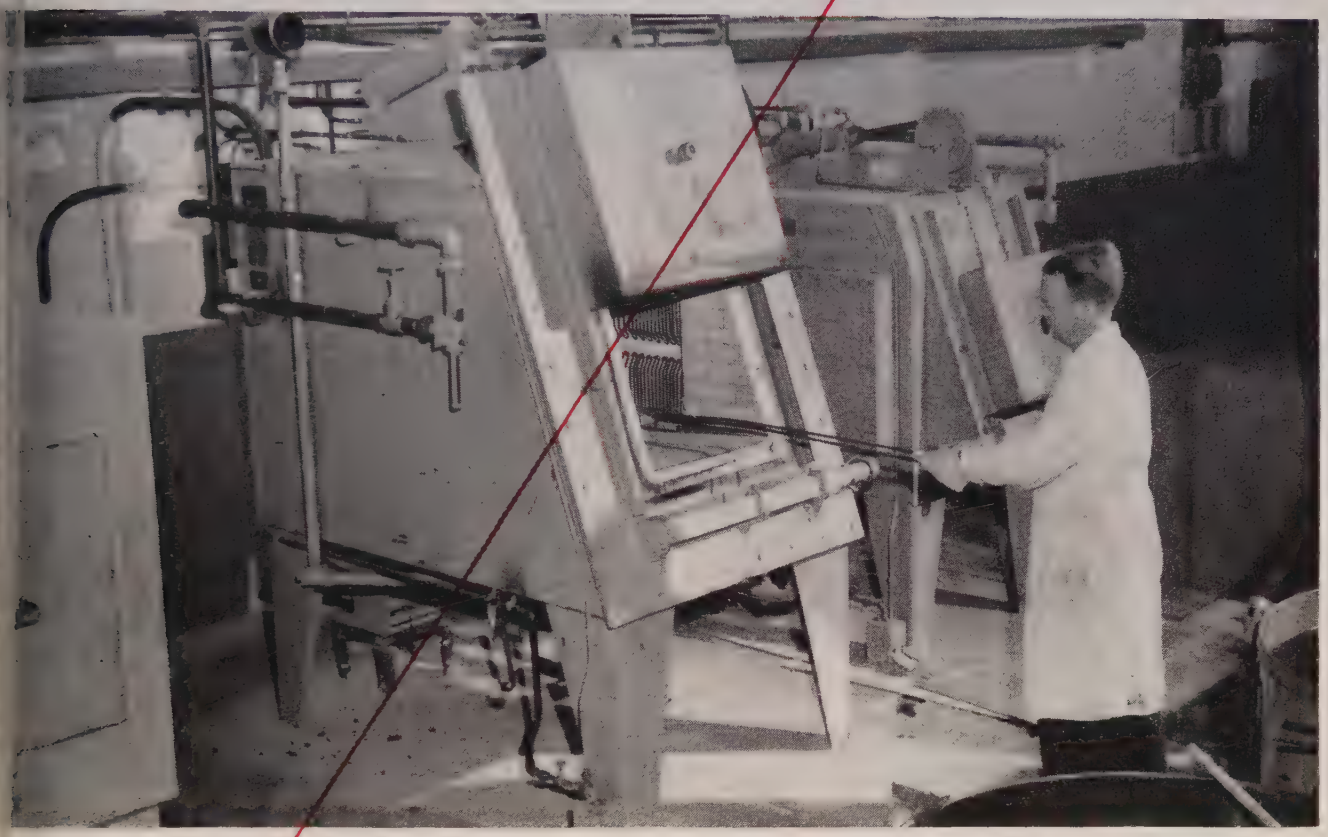
American Machine & Found... Co., New York, opened a bran... office at 520 N. Dearborn St., C... cago. AMF divisions maintain... sales offices in the building a... Leland Electric, Lowerator Sal... Bakery, and Wahlstrom/Float-L... Sales. AMF subsidiaries repres... ed are: Pinspotters Inc., DeW... Inc., Cleveland Welding Co., St... ling Engineering Co. and Un... Machinery Co. General offices ... AMF's subsidiary, Thomps... Bremer & Co., which manufactu... industrial fasteners and elect... terminals, occupies a large part ... the leased building's office spa... Thompson-Bremer & Co.'s ma... facturing plant is at 1640 W. H... bard St., Chicago. Junior T... Corp., Hammond, Ind., an A... subsidiary manufacturing velo... pedes, retains its Chicago office ... the Merchandise Mart.

AT A. V. ROE, LTD.—in Canada

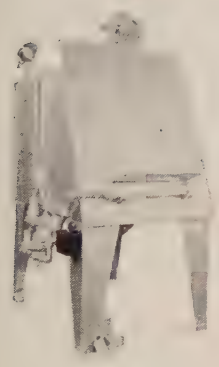
LINDBERG FURNACES

HEAT TREAT ORENDA TURBOJET ENGINE PARTS





In Canada, too . . . when production depends on precise heat treating, production men depend on Lindberg Furnaces



Proof of this is the fact that A. V. Roe (Canada) Ltd., in their new multi-million dollar aircraft plant, use Lindberg furnaces to heat treat parts for the world famous Orenda Turbojet engines.

Lindberg toolroom pre-heat and high speed Hydryzing furnaces... plus a toolroom Cyclone tempering furnace harden and temper stub shafts for the Orenda engine.

And a large box type production Hydryzer heat treats ten-stage rotor discs.

Lindberg Furnaces can solve your heat treating problem, too, from the touchiest tool and die job . . . to huge production jobs involving the hardening or tempering of tons of work daily. For descriptive literature contact your nearest Lindberg office.

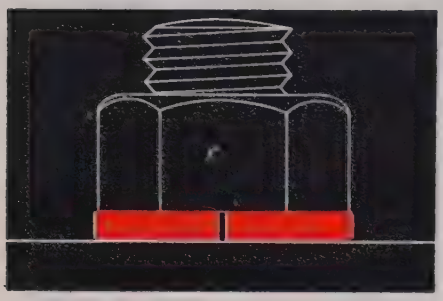
Bulletin *96hs* covers the type of furnaces used in the A. V. Roe plant

LINDBERG FURNACES

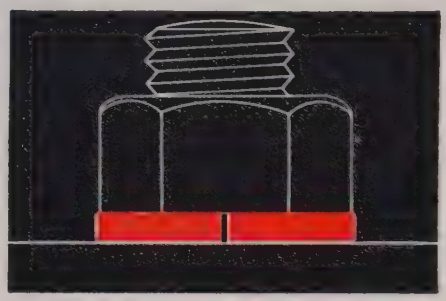
Lindberg Engineering Company, 2441 West Hubbard Street, Chicago 12, Illinois

This time-tested principle still keeps

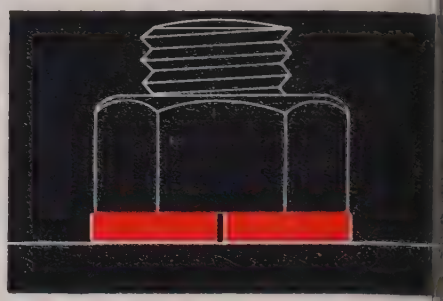
bolted assemblies tighter longer — at less cost



Against wear



Against vibration



Against bolt elongation

Reliance SPRING LOCK WASHERS

Bolted assemblies, in most instances, are no better than the spring lock washers that keep them tight. Wear, vibration and bolt elongation create looseness in bolted assembled parts.

Reliance Spring Lock Washers are helical coil in design, fabricated from spring steel and will maintain maximum reactive tension to keep thread seated tightly against thread reducing the possibility of looseness due to vibration and wear. The wide reactive range of Reliance Spring Lock Washers compensates for looseness created by bolt elongation and keeps the bolted assembly tighter longer, effectively reducing costs and providing product safety. Specify Reliance Spring Lock Washers on your next production job—there is a size and type to fit all requirements.

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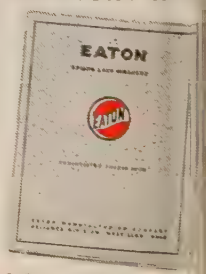

This new 36 page book, packed with information on Reliance Spring Lock Washers is yours for the asking. You'll find it helpful in planning future production line economies. Send for it today.

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Production and Engineering
NEWS AT A GLANCE

RUBBER-TO-METAL BOND — Technique that places rubber-to-metal dimensional tolerances as fine as 5 micro-finish is reported perfected by Stillman Rubber Co., Culver City, Calif. The company says its Permadizing process eliminates harmful flash and flaring of rubber and bonding agent on metal inserts, minimizes rejections and costly rework. Success has been registered thus far in bonding aluminum to varied rubber, synthetic rubber or silicone components. Parts are available for operation in a wide temperature range, exhibit extremely low swell, are highly-resistant to aromatic fuels and hydraulic fluids and have a steel-smooth finish. According to the company, parts can be made corrosion resistant where this characteristic is found to be essential.

STITCH IT—Metal stitching provides a fast economical method of assembling brushes for lawn and industrial sweepers at Parker Sweeper Co. Originally these sweeper brushes were constructed with wooden backs. When assembling each brush, it was necessary to drill 27 holes into each back. Tufts of bristles were then folded, inserted into each hole, and secured with a wire. Next step was to fasten five of these brush units to a drum which became part of the sweeper mechanism. Now the fiber bristles are placed between two half hexagon shaped strips of 18 gage steel. Hand clamps are used to hold these strips in place until stitched together with a metal stitcher. With the same number of workers, the rate of production has increased four times, even though the new sweeper brushes contain 50 per cent more bristles.

KEEP YOUR EYE ON THIS—Look for pure molybdenum and its alloys to spearhead progress on dies for die casting high temperature metals such as brass, bronze and maybe beryllium-copper. When the problem of economical die life is solved there will be nothing to stop die casting of these higher temperature metals from assuming a foremost position among metal fabrication processes.

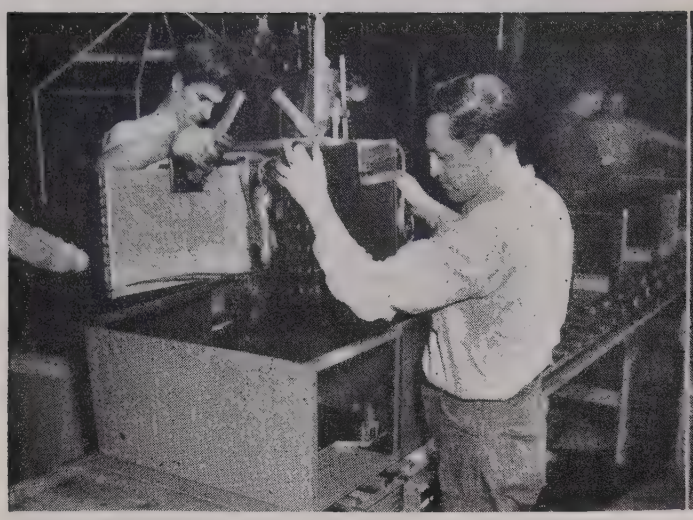
BORIDE CUTTING TOOLS—Cutting tools have been made from a binary molybdenum boride and from a ternary molybdenum-nickel-boron compound. In tests made at American Electro Metal Corp., these boride tools were used to machine steel, cast iron, aluminum and brass. On brass and aluminum, a small number of tests indicate that the boride tools are comparable with commercial tungsten carbide tool tips. Tests on steel indicate that at 200 feet per minute on a comparatively tough steel, the boride tools are capable of matching carbide performance. Further development work is necessary to study consistency and higher speed cuts. On cast iron, at surface speeds of about 135 feet per minute the life of a boride tool will exceed that of carbide. Experimenters reported that in all cases the performance of the boride tools was superior to that of high speed steel or cast alloy tools. Predictions made by these men: 1. With further development the boride tool materials should become competitive with the present standard tungsten carbide cutting tools; 2. Price should be somewhat lower than that of the carbide tools.

PAYS OFF—Vacuum melted steel is producing ball bearings that show durability beyond limits of experiments designed to measure their failure. In the superalloy realm F. J. Stokes Co. is building 500 pound vacuum furnaces for melting and centrifugally casting forging blanks for jet rotor blades. Conventional methods of melting give only a 30 per cent yield of bar stock. Tests on the new vacuum processing method give yields in range of 80 to 90 per cent. Estimations are that the average steel has about 0.02 per cent gas dissolved in it. If melted under vacuum virtually all the gas comes out. Some manufacturers are simply vacuum degassing metals components by heating below their melting point in a vacuum. Experts say that under proper conditions about 50 per cent of the gas is removed—perhaps all that would ever come out under use conditions in applications where this is a critical factor.

FRICTION AT HIGH SPEEDS—The coefficient of friction between various materials at speeds up to 2000 feet per second (1360 miles per hour) and at pressures up to 10 tons per square inch are measured in laboratories of the Franklin Institute by applying a sample to the rim of a disk which rotates at speeds as high as 20,000 rpm. The disc is operated in a steel-lined, evacuated pit to provide greater safety and to reduce air resistance. Tests results are expected to lead to improvements in constructing high speed machinery. A better understanding of the behavior of metal surfaces, especially of their friction and wear, under all conditions should indicate new ways in which metals can be prepared for specific uses.

STRONG CASTING—An investment cast motor mount is used to bear the entire weight and torque of a 100 pound, 15 horsepower aircraft starter motor. Cast from stainless steel the bracket is one of the largest precision investment castings ever produced. General Electric reports that in the two years the cast brackets have been used to mount the starter motors the only failure resulted when a bolt sheared. Investment casting proved to be the most economical method of producing the motor mounts from stainless steel. Because of finish-machining operations a forging cost two and one-half times as much as an investment casting. Castings now being used require only four finishing operations to prepare them for installation.

Metalworking Outlook—p. 41 *Market Outlook—p. 141*



Nesting refrigeration system into cabinet where it is secured with U-type Speed Nuts. Inaccessibility of the mounting ears requires self-retaining fasteners

Attaching cooling coil to base cabinet, the assembler aligns the panel holes with one hand and drives screws with the other. Air-powered tools speed the assembly

Quantity Up, Quality Too

Solution to Carrier's problem of getting greater volume while maintaining reputation for quality came from new assembly lay-out and greater use of high speed fasteners

INCREASING consumer acceptance for a product often necessitates a change in manufacturing procedures in order to get volume without any reduction in quality. That's the spot Carrier Corp., Syracuse, N. Y., found itself in when room air conditioners moved from the commercial and luxury markets to their present position as another widely accepted home appliance.

Job shop assembly methods formerly used wouldn't produce the volume needed and yet Carrier had no intention of sacrificing any of the quality that had marked its products through the years. Still, quality at all costs was out because the units have to sell in a highly competitive market.

Production Lay Out—The solution adopted was to set up a conveyor line for final assembly fed by a series of subassembly areas. Various conditioner components are assembled into the chassis with Tinnerman Speed Nuts not only to cut assembly time but to assure vibration-proof attachments.

Use of the high-speed fasteners isn't a complete departure from former assembly methods but the newest models require more, both in number and type. The earliest applications of these fasteners replaced conventional sheet metal screws that loosened in shipment.

Accelerated Assembly—So with a background of successful fastener performance, company engineers took advantage of additional types of Speed Nuts available in designing the new line. By properly planning both the subassembly and conveyor line assembly operations, the flow of room units in four sizes moves along without a hitch.

A conveyor belt 300 feet long and moving at 30 inches per minute is used for the final assembly operation. Components ride to the final assembly line on an overhead supply conveyor at 30 feet per minute. Two parts are placed on the endless chain supply conveyor for each cycle of operations making it possible for the assembly teams to select either without scrambling. Work stations are so planned that no worker has to move more than 6 feet in performing his entire assembly function.

Grouping Jobs — Subassembly areas are used for welding the cabinet after receipt of component from the press department; fa and motor assembly; insulatin cabinet, hydrolene applicatio hanging Speed Nuts on propo points of cabinet and assembly c small parts; and necessary brazin This last area is used for brazi of all units. A pellet that also ac as a simple jig for brazing is use to carry the condenser unit to th assembly line.

Refrigeration subassembly are is not only used to gather the co denser coil, evaporator coil, com pressor and suction and discharg lines but also to test, evacuate an charge the unit for service. Th complete refrigeration unit dropped into the cabinet to sta the final assembly operation.

It's a Snap—Securing the sy tem to the cabinet is simplified b U-type fasteners that are snappe into place by hand. Position mounting ears made self-mountin fasteners necessary on this job an these fasteners eliminated th need for expensive equipment an skilled help to operate it. Air-o erated power tools reduce the ma ual effort required and speed th fastening operation. In assembl

nstalling the condenser fan housing is speeded by us- ng a self-retaining clip (inset) to hold the bottom n place. U-fasteners at top complete the assembly

The assembler's job of installing control panel and retainer bar is made easier and faster by fasteners that are self-retained in screw receiving position

operations where alignment of the nating parts is necessary, the as- sembler can use one hand to align he work and drive screws with the other.

Panels such as baffles or the condenser fan housing are secured at the bottom with S-shaped clips specially designed for Carrier. This method of fastening panels with a spring cushion prevents crazing and chipping in handling or ship- ment plus eliminating holes in panels or flanges. The clip is quick- ly snapped over one panel, the second panel slips in the clip and is anchored at the opposite end with the U-type fastener.

Testing the Job—Following completion of work on all mechanical components, electrical connections are made and the damper chain assembled. Each room conditioner then gets a capacity test and an electronic leak test. The leak test is conducted in pressurized rooms and the test unit used has a minimum sensitivity capable of detecting a leak so small that only 1 ounce of refrigerant would escape in 100 years.

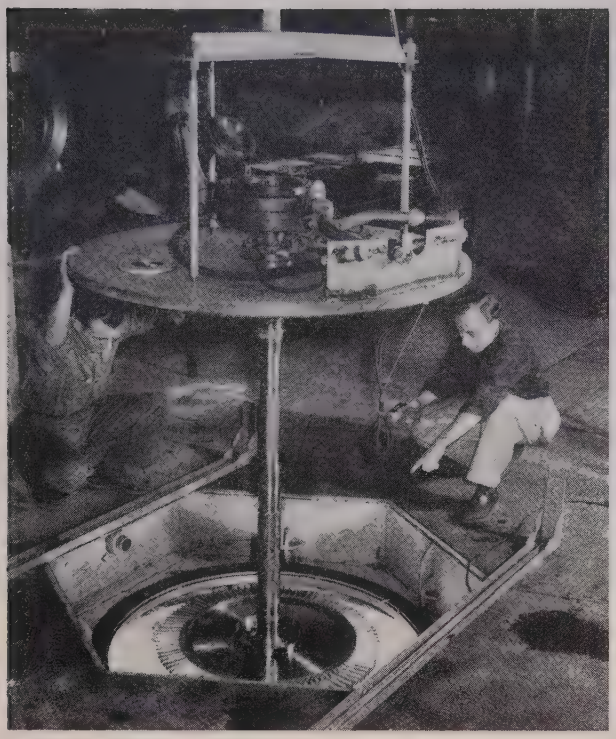
All that remains is assembly of the cover and nameplates and cleaning. The completed units are placed in corrugated paper containers at the end of the conveyor line and moved from there into shipping.

Make It Right—In event work is required on the refrigeration unit, it must be returned to the subassembly area. This requirement does not produce any bottlenecks, as the refrigeration unit is tested, evacuated and charged prior to moving to the assembly line and almost all difficulties are corrected at that time.

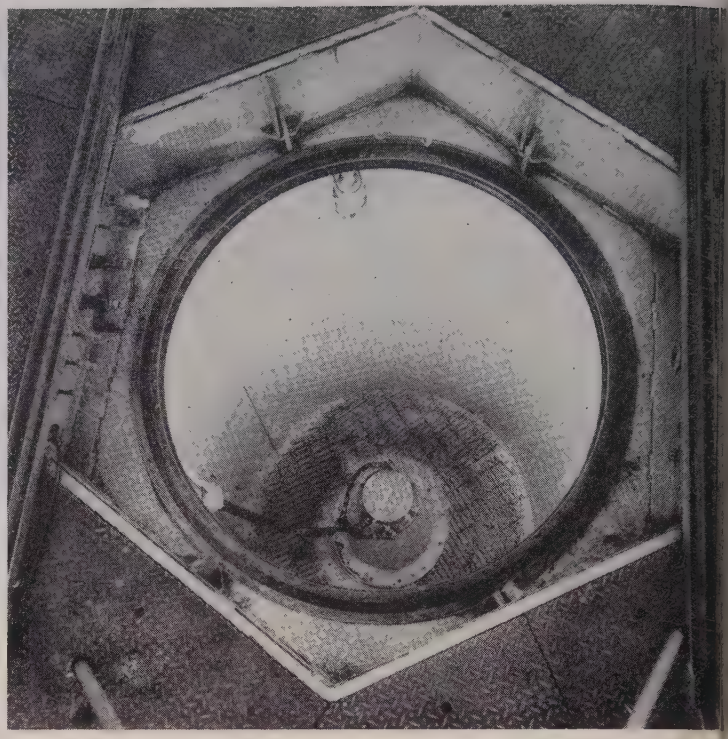
Design of the product to facilitate the use of high speed fasteners and the layout of the work areas to take advantage of latest handling and assembly techniques enables Carrier to maintain high production and quality. One room-size unit comes off the line each 1.7 minutes, yielding 550 units per day on a two-shift basis.

Room air conditioner units get intermediate inspection as they near end of the assembly line. The units still must get the leak test and have covers installed

Completed units at the end of the continuous conveyor are bedded into shipping cartons. Good engineering and modern assembly pay off in trouble-free operation



Turbine wheel to be tested is mounted on a special arbor connected to the driving turbine on top of the cover plate. Lower end is anchored on pedestal bearing



View of test pit shows pedestal and bearing; outlets for vacuum, cooling, lubrication and measuring lines. Rubber gasket around the rim gives a vacuum-tight seal

Production Testing GOES FOR A SPIN

Rotating parts at high speeds began as a design aid, but production men in many industries see advantages, too. One is stretch spinning before final machining

By GEORGE W. EHRSAM, JR.
Manufacturing Division
Warren Brothers Roads Co.
Cambridge, Mass.

SPIN TESTING is emerging from its laboratory cocoon. Originally used as a means of proof-testing high-speed turbines, the everyday requirements of a world of speed have extended applications of this test process into a growing list of industries.

Biggest users are the aircraft and automotive industries with electronics and instrument makers following close behind. Some of the newcomers are in the fields of plating, abrasives, and electric motors.

Tests Important—With current rotational speeds of 85,000 rpm not uncommon, and a future outlook of speeds even higher, the deformation and plastic flow characteristics must be as carefully checked as those of vibration and safety. Failure of a high-speed rotor in an assembly can result in destruction of valuable mechanisms, considerable lost time and serious accidents.

Safety isn't the major gain, though. Often invaluable design information can be gleaned. In most of the high-speed turbines, rotors are the heaviest and most costly items. Design of the turbine wheel should be such that it utilizes strategic materials efficiently, something that can only be known when the factors affecting the strength of the part are known.

Aircraft First—The aircraft gas turbine industry found this out in its earliest days. Each new alloy used often resulted in different deformation characteristics when subjected to the high centrifugal forces. Thermal stresses also presented problems which merited serious consideration.

Rim and blading of such a turbine wheel operate in temperatures a great deal higher than the shaft and central portions. The complex stress distribution generally resulted in designs that included very high margins of safety. Simulated operation in the spin tester at the design stage helped reduce the guesswork and produce a more conservative design.

"Hot" Tests—To most accurately

hulate operating conditions, a rmal production test stand was uipped to spin-test rotors un- r temperatures identical with ose in the engine. Heating ap- ratus consists of induction heat- g coils placed in such a position to raise the rim and blade tem- ratures to 1000-1500° F, while e hub and web are kept cool by ater jet.

Central portions of the wheel are nerally operating at tempera- res low enough so that the time/ mperature dependent does not af- ct the material strength. The rim rtions, however, operate at such gh temperatures that any stress alyses must assume time/tem- rature phenomena, and elevated mperature must be present for curate experimentation in these eas.

Stress-Coating — While the hot in pit is the most accurate meth- l available for the stress analysis the turbine rotors, some design- s and analysts have resorted to ress-coating as an aid in observa- on. An enamel-like substance, the ating is applied to oil-free sur- ace prior to spinning and allowed o harden before the wheel is run t speeds apt to create deforma- on and plastic flow.

Upon removal from the test pit, the stress coat will show the trained observer fissures or fractures equivalent to those in the rotor. Hardness of the coat and its adherence to the wheel surfaces subject it to like stresses when rotated to high speeds. Often an application of a liquid of contrasting color is wiped across the surface to bring out the demarcation of the stress indications.

Spinning for Growth—Designers and manufacturers of impellers for superchargers have found that by overspeeding the pieces from 10 to 20 per cent prior to final machining, they bring out the majority of the growth or stretch. Machining done after castings or forgings have reached their ultimate size, is a positive process. Testing at this time also reduces the requirement for excess clearances between casing and impeller.

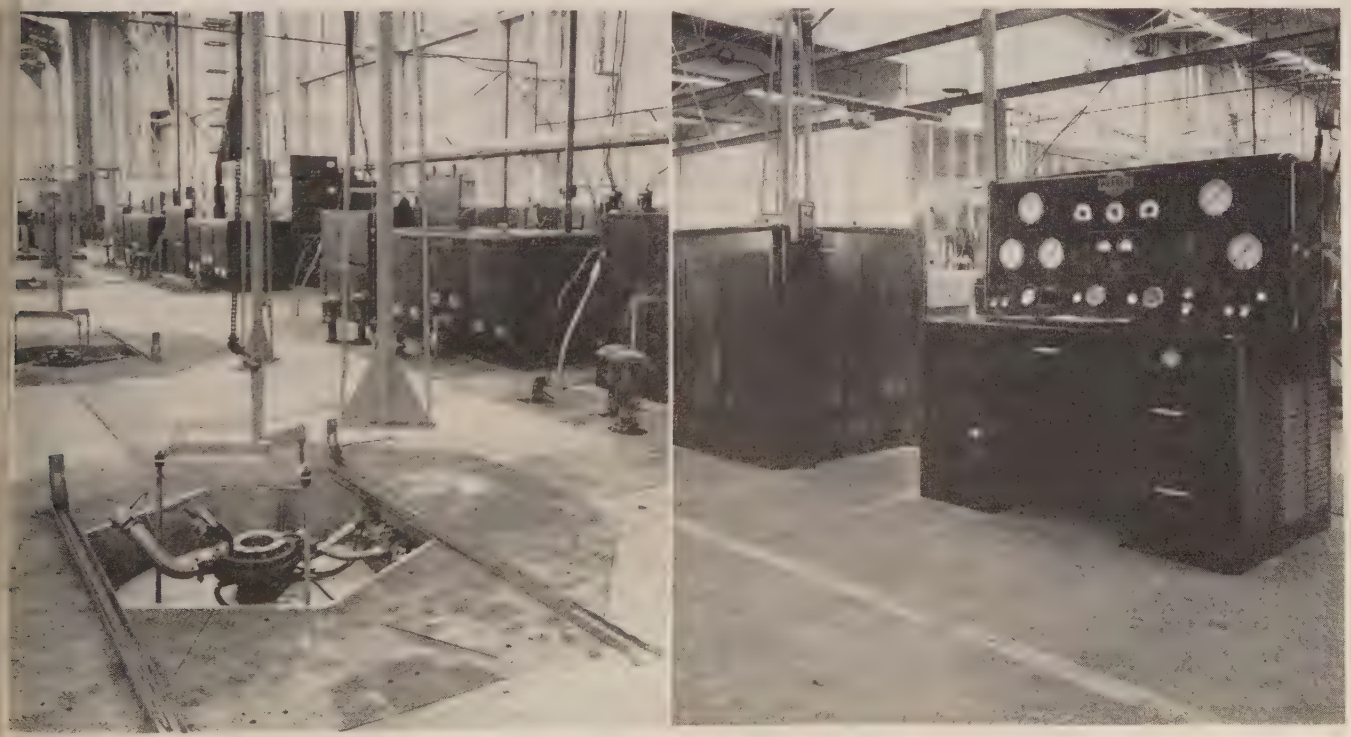
One producer claims that 95 per cent of the damage done to his production supercharger has been caused by impeller bind in the casing. After installing spin testing equipment, to grow the impellers before machining, he reduced his trouble on this count to about 4 per cent. Where impellers are bushed through their center bore, it is almost imperative that the plastic deformation be accomplished before final boring of bushing diameters, because any deformation is apt to destroy the required bushing fit.

Grinding Wheels, Too—Increase in grinding speeds has brought numerous new compositions for grinding wheels. The disintegration of these wheels at high speeds is bound to bring serious damage. One Massachusetts manufacturer has used a high-speed test unit to spin-check every wheel coming into the plant. His savings in man hours and compensation claims, he predicts, will pay for his test equipment in about two years.

In addition to these few examples listed, plastic coatings and platings can be analyzed for effectiveness of bond by the spin test method. Forgings and castings can also be checked for internal flaws before expensive machining.

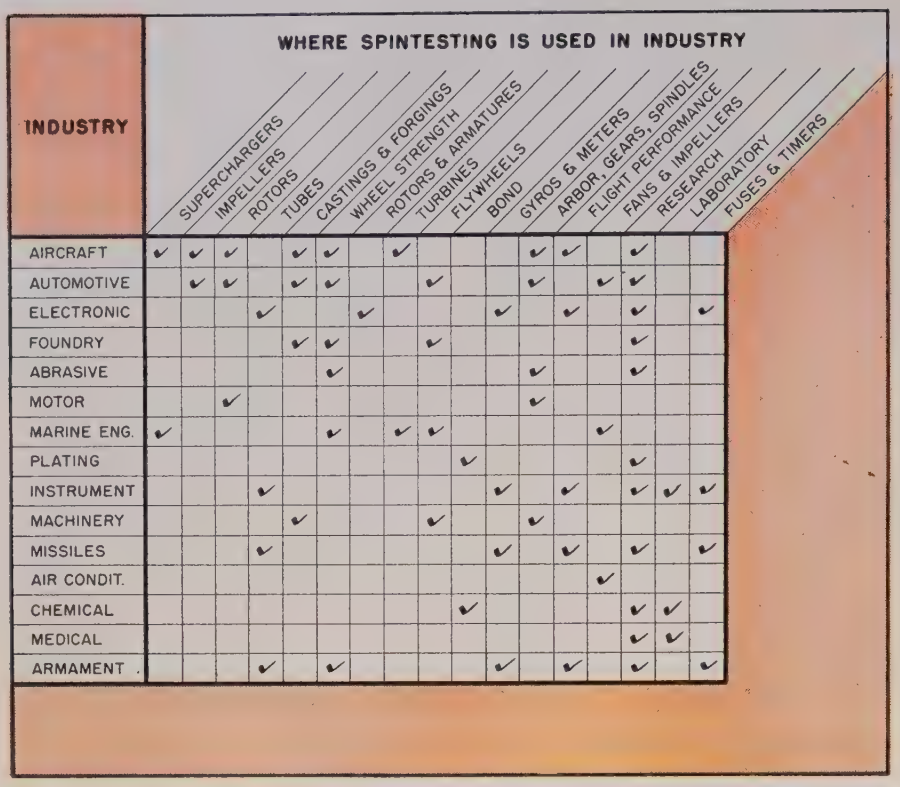
Test Procedure—In general, the test procedures vary little, regardless of what type rotor is being tested. The test piece itself governs the configuration of the adapting arbors used for linkage to the drive turbine.

These arbors are a most critical piece of equipment and much at-



Three of the spin-testing pits at Bridgeport-Lycoming, together with individual control desks and service units. Each pit has its own crane for lifting the test units

Service unit, center, houses vacuum pump and its motor, as well as lube oil system for turbine bearings. Desk at right contains all the gages and controls for tests



tention must be paid their design. In rotating small units, they should incorporate some extra weight and mass to compensate for unbalance in the test piece and minimize any chance for lash in the rotor. Diameters of the adapters should be machined to allow minimum eccentricity between them and the diameters of the piece to be spun.

Vibration Is Problem—With the increase in speed of any mechanism comes an increase in the vibration problem. At the lower speeds, any unbalance in the test rotor will cause vibration. As the critical speeds are surpassed, the center of rotation will be eccentric from the geometric centerline by an amount varying with the amount of unbalance.

By either static or dynamic balancing, the unbalance in the test piece should be corrected so as to restrict this shift to not more than 0.010-inch. Adapters should be balanced to at least half the balance tolerance of the test pieces. This figure of 0.010 will be high for the larger rotors, particularly jet power plants, where a shift of 0.005 is generally considered maximum. During test operations the vibrations of the piece can be observed by either mechanical vibration pickups or by an observer watching through the glass parts in the tank.

Vital Statistics—Driving power for the three Warren Brothers production model spin testers comes from either a two, a four, or an eight-inch turbine. The smallest model on the VHS #3 unit operates on an inlet air pressure of about 45 psi and is capable of speeding small rotors (maximum diameter 6 inches and maximum weight 5 pounds) to speeds of 100,000 rpm.

The second and third sizes, models VHS #2 and VHS #1 respectively, require inlet air at 115 psi and a flow rate of from 1500-2500 pounds per hour. The VHS #2 has a load capacity of 100 pounds at a maximum diameter of 20 inches. This unit drives rotors to about 60,000 rpm. For very large rotors and impellers, weighing up to 2500 pounds and measuring not more than 55 inches in diameter, the model VHS #1 is used with its maximum speed of 25,000.

Thus rotors and impellers, from the very smallest to the largest, can be spun to high speeds. Turbines on all of the aforementioned models, of a Terry, slip-type design, ease themselves through the starting torques by spilling the drive pressures they cannot handle. Thus spindle failure, under heavy inertia loading, is minimized.

Fast Acceleration—In addition to the standard turbine drive, the company has done considerable development work on units driven by electric motors, both high-frequency motors and high-speed motors with geared increasers. The units are now capable of driving small rotors to high speeds (30,000 to 50,000 rpm) at tremendous acceleration rates.

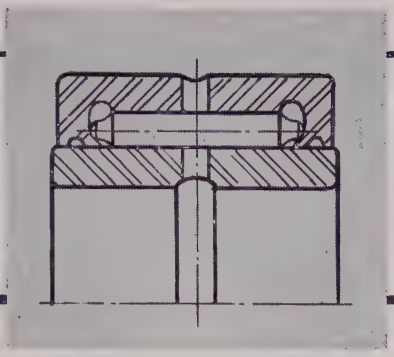
One unit now being built, spins a small turbine wheel to 30,000 rpm in 30 seconds. These acceleration rates are valuable to firms whose large volume of production requires pieces to spend a minimum of time in the test areas. These units are of even greater advantage to plants where the volume of steam or air happens to be limited. With some lubrication and fuel oil pumps, requiring accurate speed regulation and control, the electric drives have more to offer in this regard than the turbine drives.

Vacuum Operated—Normal power requirements of the drive are greatly reduced through the evacuation of the test pit. With an air load in the tank of approximately 150 microns of mercury absolute the windage effect and the heat are negligible. For example, with the large VHS #1 tank, the rise in temperature, after spinning an average rotor (300 to 600 pounds) should not be more than 25 degrees above the ambient operating temperatures.

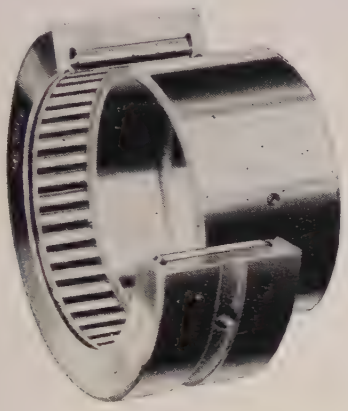
It must be remembered that any increase of air in the tank will lead to an increase in temperature. These pit tanks are air-tight with the cover sealing on a compression gasket in the tank. Vacuum service unit encloses the vacuum pumps and motors, the vacuum condensate tank and the lube oil system. This self-contained unit varies in size with the test pit.

The third piece of equipment is the Warren Brothers stand contains the necessary controls and instruments to operate. The pressure gages, the speed measuring instruments, and the lubrication are all controlled from this remote control stand. Speed is measured on this stand through either an electric tachometer, a frequency meter, or an e-put meter.

A bearing design of simplified construction reduces internal wear



The performance efficiency and life expectancy of anti-friction bearings depends to a great extent on the ability of the bearing designers to hold internal wear to a minimum. They have found that wear can be materially lessened by reducing the number of bearing parts subjected to wear. In the case of MULTIROL SE Series roller bearings all parts have been eliminated except the anti-friction essentials of load carrying rollers and contacting races. Loose or welded in retaining rings and cages ordinarily found in roller bearings of this type have been discarded in the exclusive MULTIROL design.



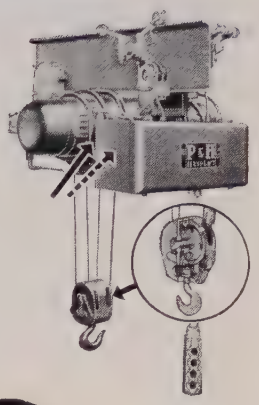
Here rollers are retained by rolled over lips on end shoulders that are solid extended sections of the outer race. Cages are not required and other delicate parts that may wear, warp or break loose in mounting or in service are not needed. Numerous other advantages accrue from this MULTIROL bearing construction in addition to reduced internal wear and longer bearing life.

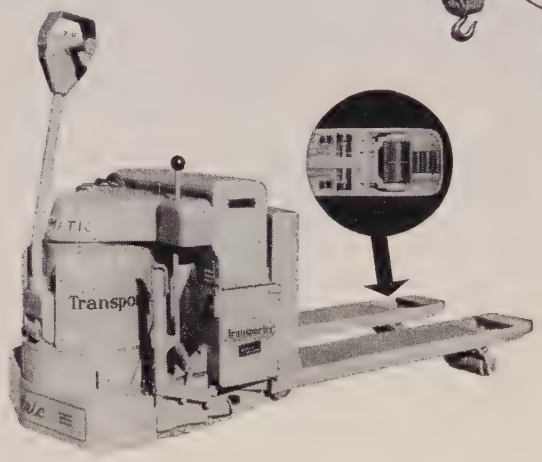
Lubrication Advantages

Important among these is the extra protection against destructive foreign particles provided in SE series bearings by a lubricant retaining groove, built into the inside diameter surface of the roller retaining end shoulder. The ring of lubricant held in this groove acts against the inner ring O. D., increasing the sealing effect of the precision tolerances between these shoulders and the inner race. Notice, too, the groove above the roller ends. Acting as a lubricant reservoir, this groove provides MULTIROL SE series bearings with an extra margin of protection against neglected or delayed lubrication.

Typical Performance

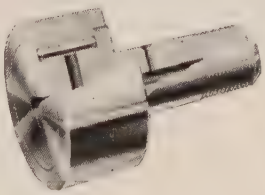
Harnishfeger P&H Hevi-Lift electric hoists carry up to 15,000 pound loads on MULTIROL SE series bearings. Their extra capacity and precision with ruggedness help reduce necessary radial bearing space in the upper and twin bottom sheaves. Two additional SE bearings add smooth efficient and dependable performance in the hoist transmissions.



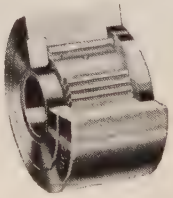


The Automatic Transportation Company's Transporter uses eight Multirol SE Series bearings in the four rear wheels to carry 6000 pound capacity loads easily and freely. Wheels are mounted dual on each fork and two bearings with a center spacer support each wheel. These small but rugged bearings accommodate a large shaft with a comparatively small O. D. and materially reduce starting and rolling friction for finger-tip maneuverability of this heavy duty material handler.

Other McGILL® Bearings



MULTIROL CF



MULTIROL CYR

GUIDEROL CT

A new 140-page Bearing Reference Guide complete with 30 pages of vital engineering data has just been released by the McGill Manufacturing Company. It has the full story on the advantages of Multirol SE Bearings as well as information on the Multirol CF and CYR and Guiderol Bearings. Send now for your copy of McGill Catalog No. 52.

McGILL® — Precision Bearings

McGILL MANUFACTURING COMPANY, INC.
301 N. Lafayette Street, Valparaiso, Indiana

This is *PRECISION*

A-C Crane Hoist Control

15 Tons of Steel . . . handled as though it weighed a pound. The picture at the right tells the story. A walnut and wrist watch were placed side by side. The operator lowered the 15-ton, full-hook load. The walnut was cracked. Then the load was raised without the least settling action. The watch was left untouched.

That's Precision . . . precision that is attained on all cranes equipped with the new Westinghouse Load-O-Matic Crane Control. In this particular test, the load was lowered with the master switch set at the first point lower. No jogging, inching or retardation was necessary—lowering rate was smooth and steady.

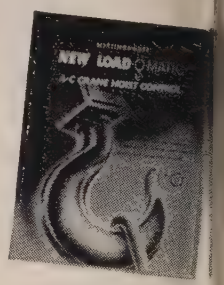
The Load-O-Matic hoists and lowers *all* loads—the empty hook, light or maximum loads—at stabilized speeds. Loads can be brought to a standstill or suspended by action of the motor only

VERNIER CONTROL PROVIDES FLEXIBILITY

Additional flexibility of operation is available with the auxiliary Vernier control. This control component is especially useful for high-accuracy spotting. For example—with full load on the hook and the master switch on the first lowering point, operation of the Vernier provides control from approximately 7% of full speed to standstill. Operator can actually float the load into the desired spot.

ASK FOR DESCRIPTIVE BOOKLET B-5417

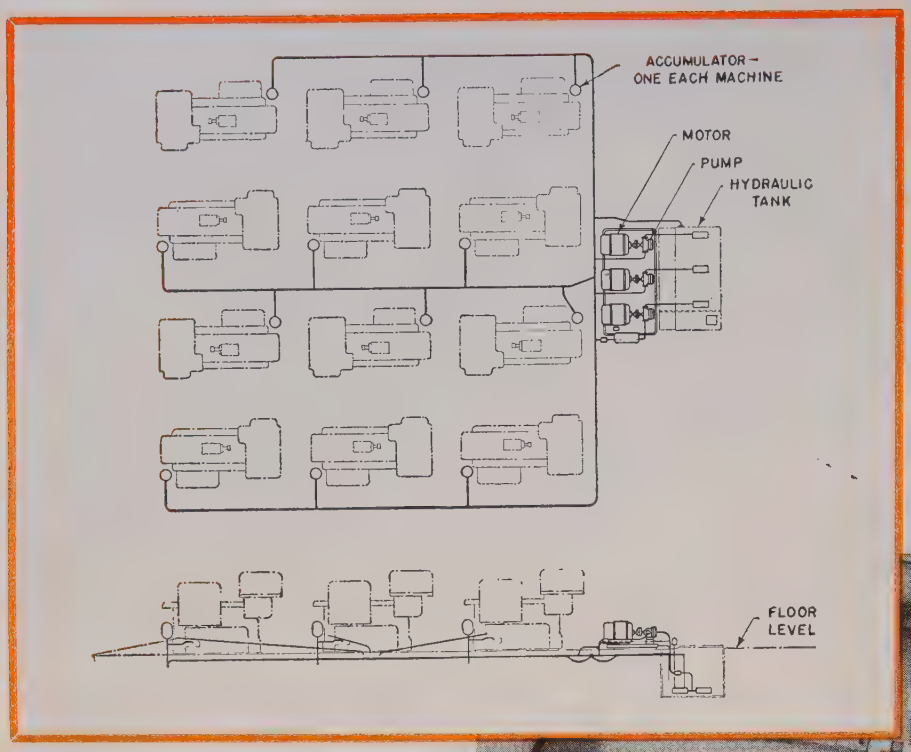
This booklet describes all the operating characteristics and features of the Load-O-Matic a-c crane hoist control. Ask your Westinghouse representative for your free copy, or write direct to: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-27015-A



YOU CAN BE SURE...IF IT'S

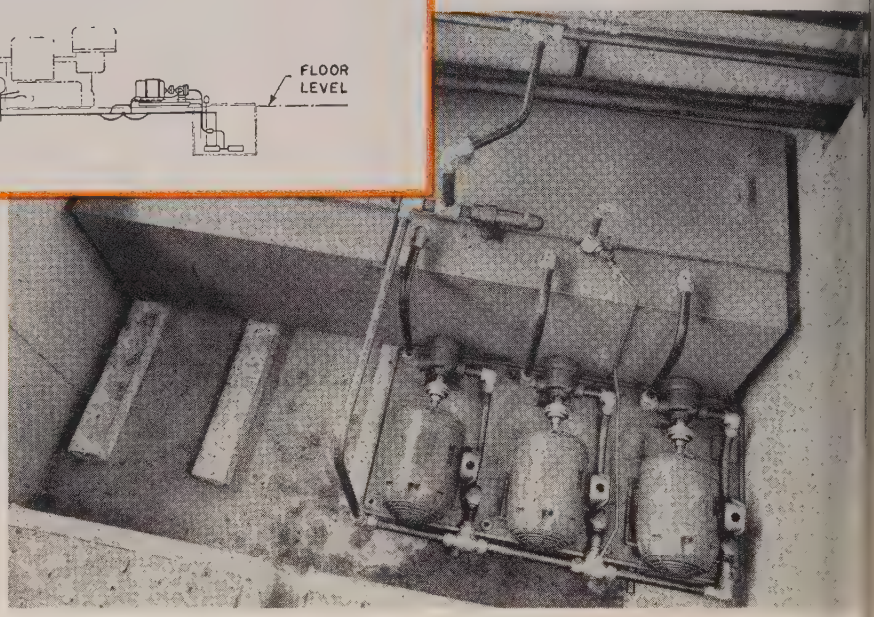
Westinghouse

This simple test of the Westinghouse Load-O-Matic was conducted at a Materials Handling Conference and witnessed by more than 100 engineers. The full load of 15 tons was lowered at an almost imperceptible speed till it cracked the walnut. The watch was not damaged. Then the load was raised without the least settling action.



At left is central supply unit whic
furnishes the hydraulic power for
battery-type machines. The accum
lator at each machine takes care
peak demands during the work cyc

Three motor-pump units—one is f
standby—and a 350-gallon tank a
mounted in pit, below the floor leve
for central supply of hydraulic flu
to machine tools. Simplified maint
nance is one big advantage of syste



Central Hydraulic Supply...

Applied to battery-type machine tools, it lowers initial cost of installation and makes for simpler and more effective maintenance. It's another avenue for economy

CENTRALIZED supply of hydraulic power for machine tools, like centralized supply of cutting fluid and lubricant, offers an opportunity for reduced cost and simplified maintenance of machine installations.

Although the supply of both lubricant and cutting fluid from a central point are both widely recognized, similar systems for furnishing hydraulic power are often overlooked as another avenue for cost cutting.

High Production Natural—Several installations of Heald Machine Co., Worcester, Mass., internal grinders are using the central hydraulic system and have shown that real savings result. The system is particularly applicable for internal grinding operations where the setups are of a similar nature and requirements for high-production rates must be met.

Components such as bearings, bushings, valve inserts and universal joints are among the items being ground in the machine-bank installations.

Takes Twelve — Heald's central hydraulic system can be arranged to handle up to 12 machines, each one receiving a sufficient volume of oil to operate table cylinde numerous oil-operated valves, fe boxes, hydraulic wheel dressers a other units. Similar system available for up to six machines.

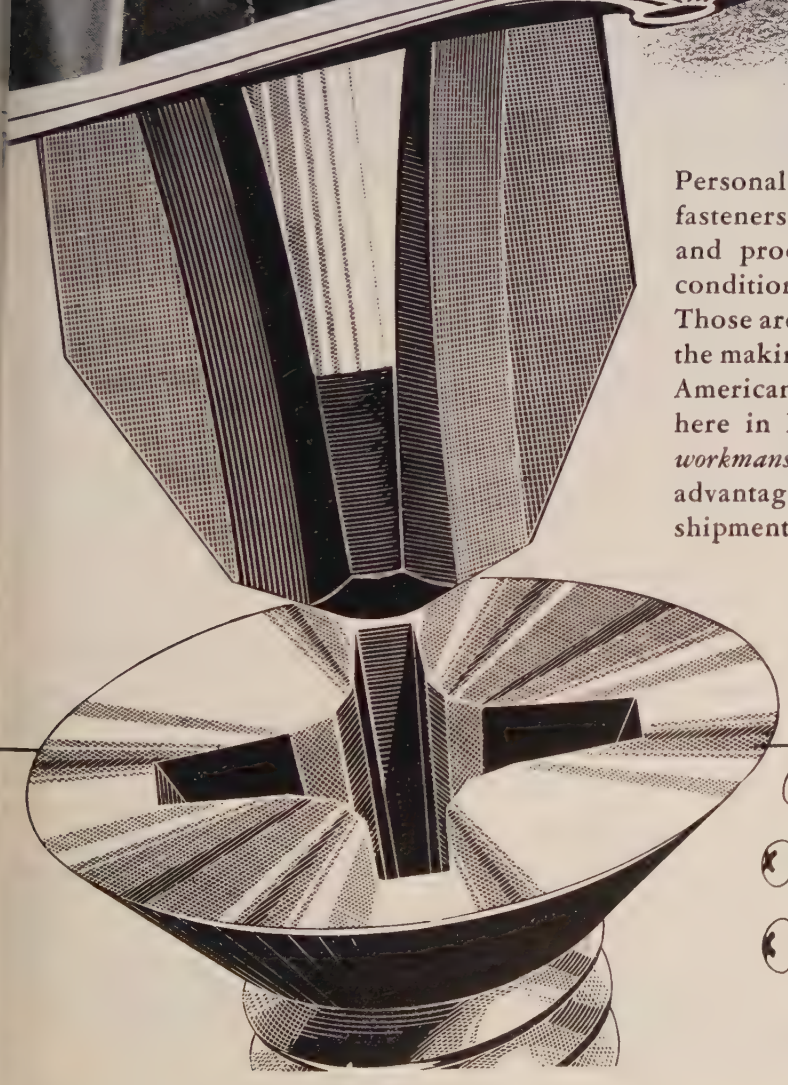
Central system consists of a large reservoir, which may be po tioned below floor level to conser space, and three electric mot driven pumps mounted on reservo Two of these operate normally the 12-machine installation w the third as a standby for em gency use.

Sub-Floor Flow — Piping, wh may also run below floor level trenches behind the machin

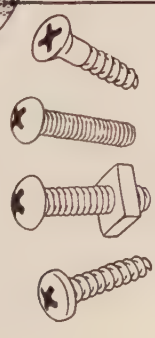
THE AMERICAN STORY

CHAPTER TEN

What makes a "Good American"?



Personal skill in the quantity production of quality fasteners. The finest and most modern tools, gages and production machines. Living and working conditions that foster health and contentment. Those are some of the chief advantages that go into the making of "good Americans" . . . and the good American products that are turned out consistently here in New England . . . *where justified pride of workmanship is still just as strong as ever.* And these advantages work to *your* advantage, too, in every shipment of American Screws and Bolts.

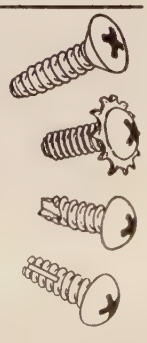


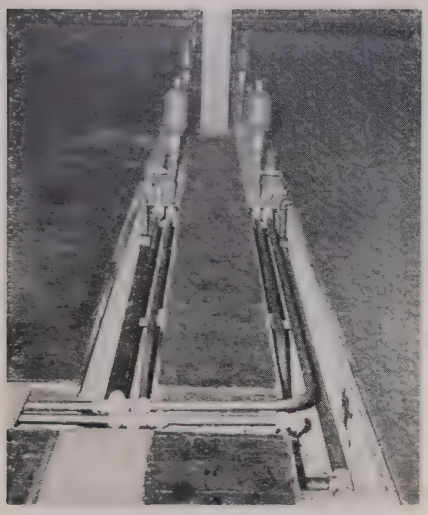
AMERICAN SCREW COMPANY

PHILLIPS HEADquarters

WILLIMANTIC, CONNECTICUT

Main Office & Plant
Willimantic, Conn.
Office & Plant, Norristown, Pa.
Office & Warehouse, Chicago, Ill.





Piping from central supply can be run through trenches under floor. Accumulators here are lined up for machines

makes it a simple matter to supply oil to each machine using short hoses for pressure and return lines. A hydraulic oil accumulator for each machine takes care of peak oil demands during certain portions of the machine cycle. Filters in reservoir are used to insure clean oil delivery at each machine.

This type system can offer substantial savings on initial costs. Three pumps and tank provide adequate volume of oil to operate a battery of up to 12 machines. This is in contrast to each individually powered machine having a separate pump and tank unit plus additional valves, piping and wiring.

Room to Grow — One manufacturer has installed one machine on a central system. He sees expanded production ahead for his plant which will necessitate the addition of more grinders. From now on the machines he buys will be battery type, and they will work off the central system already installed and in operation.

Maintenance problem of the central system is, by nature of the setup, a simple one. Two 18-gallon pumps provide the necessary oil volume for 12 machines operating simultaneously.

If maintenance is required on one of these pumps, a third standby pump eliminates machine downtime during maintenance work. No time is wasted in checking oil levels in individual tanks. This makes for a cleaner installation at each machine position.

Other Gains—Operation of 12 machines separately requires individual 1-hp motors to drive hydraulic pumps or a total of 12 hp when all machines are running. With the central system two 3-hp motors or 6 hp are needed. Also, when only six machines are operating one 3-hp motor will provide necessary power.

Divorcing the power unit from the machine further reduces the possibility of inducing vibrations in the machine base. Heat, too, is an important factor in precision grinding and, here again, the exclusion of the power unit from the base reduces heat transmission into the machine.

New Kilns for Grinding Wheels

Two new-type periodic kilns, employing their own railroad cars, are enabling Electro Refractories & Abrasives Corp., Buffalo, N. Y., to fire grind wheels in a fraction of the time formerly required. The kilns are a major feature of the company's recently completed vitrified grinding wheel plant.

Each kiln has two cars and two sets of tracks—a main line into the furnace and a siding. Kiln furniture and work to be fired are loaded onto a car outside the kiln, then run in for the firing operation. Base of the kiln and its door are attached to the cars. When a car is pushed into the furnace, the door seals the opening through which the car entered.

These unique kilns differ from the ordinary type in that the floors and doors constitute a single movable unit built onto a car and rolled into place on tracks. The floor is a fixed part of ordinary periodic kilns so that the furniture and work must be carried in rather than loaded outside. Then, after firing is finished, the ordinary kiln and its contents must be cooled down sufficiently for a man to go in and unload it before the next load can come in.

With Electro's new kilns, the second load is placed on a separate car on the main track while firing of the first load is taking place and the kiln is ready for the new load long before it would be cool enough for a man to enter to unload it.

Keys to Production Contro

PRODUCTION control is essen tially a state of mind, not an ove abundance of routines, procedure and forms, W. W. Gilmore, pres dent of the Micro Division of Mi neapolis-Honeywell Regulator Co recently advised executives atten ing the American Management A sociation's national manufacturi conference in New York.

Gilmore said that this state mind, starting with top manag ment, means "a healthy respect f scheduled dates and care to s that dates are not set that can be met. For this, industry nee just enough production control do the job without frills." He re ommended that management eli inate excessive forms and proce ures that do not help meet sche uled dates.

Stages—Main steps in produ tion control, according to Gilmor are:

1. Enough raw material in t plant to govern production, bas on the amount of flow time ava able for replacement of parts.

2. A set of books that tells a curately how many parts are ava able at all times to meet produ tion requirements.

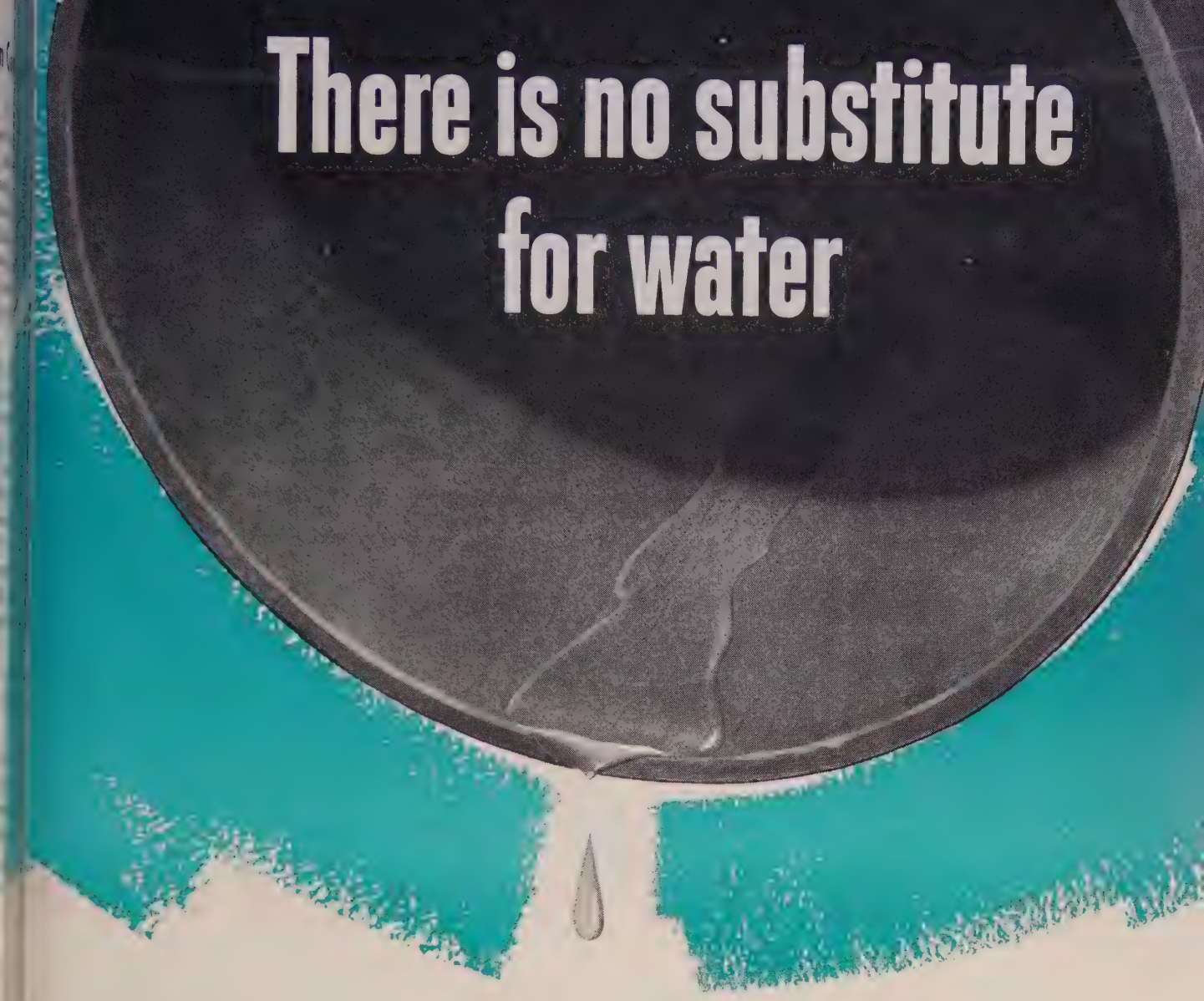
3. Enough parts on order a scheduled in to replace all inv tories as used.

4. Departmental scheduling a cording to machines and person so that dates may be establish as to when parts are needed in t next department.

5. Assembly scheduling on a ma hour-per-unit basis which perm shipping schedules to be met time.

Tool Brings Out Deep Secrets

The Petro-Mechanics resear division of Borg-Warner Co Chicago, has devised an automa recording device which can lowered into even the deepest wells. It forms part of a conve tional drill string, records for on various parts of the drill, a measures the impact resulti from the contact of the drill a the formation. It also reco temperatures, stresses, pressu and mud velocities.



. . . and there is no substitute for experienced engineering in developing a dependable water system

Nothing has ever taken the place of water among the basic needs of man. And nothing will ever take the place of safe, sure, *experienced* engineering in developing a dependable water supply.

Layne's reputation as the world's most experienced developer of well water systems was earned by engineering skill every step of the way—from on-the-spot geological surveys to the precision designing of each pump for its particular job. For the best in well water systems, there is no substitute for Layne engineering.

Let Layne engineers help you PLAN AHEAD on your water needs

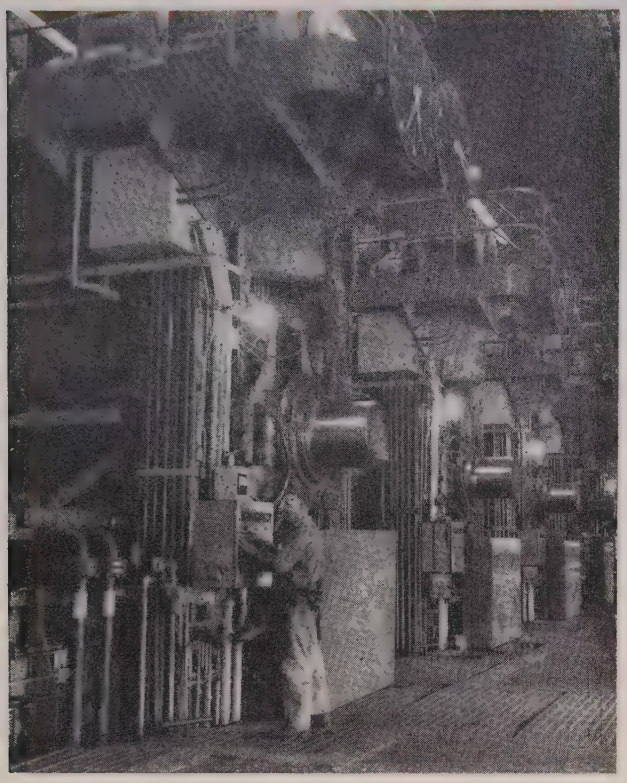
Layne welcomes the opportunity to share in long-range planning for water-system needs. Contact your nearest Layne Associate Company or write Layne & Bowler, Inc., General Offices, Memphis 8, Tenn.

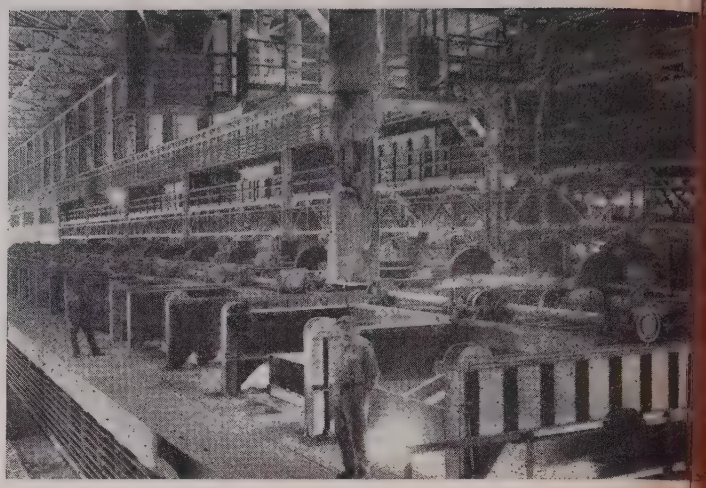
Layne

WATER WELLS

VERTICAL TURBINE PUMPS

Layne Associate Companies Throughout the World





Above is a view of five-bay soaking pit. Pit covers a
ingot buggy are remote controlled from the crane ca
Ingot stripping is done in-line at the extreme

Strip up to 72 inches finished width can be rolled down to 20 gage on this six-stand, 4-high finishing train. Mill's full-running capacity is 150,000 tons per month

Strip Mill With Designed-In Extra

Most new rolling capacity just about fills a production gap. Not so at Armco Ashland. They planned ahead of today's demands with their new 80-inch hot strip line

SELDOM is the progress comparison between new and old more striking than it is at Armco Steel's Ashland, Ky., Division (STEEL, May 25, p. 76). In one building runs the last word in continuous hot strip mills, and alongside it is the granddaddy of all continuous mills which rolled its first ingot almost 30 years ago.

In those 30 years, the steel industry has learned a lot about the art of continuous rolling. In fact, the mill at Ashland which started it all was obsolete before half of that time elapsed. So when Armco began planning a new 80-inch mill, they resolved to design ahead of present needs. Ten years' time will tell how well they succeeded.

Future Thinking—Best way to describe the new operation, using typically conservative mill language, is to say that it is a "sturdy mill, with ample power." Future thinking went further than power and equipment considerations, however.

Profiting from the experience of other mills, design men saw to it that water was plentiful, that the runout table was comfortably long, that the scale removal system was more than adequate; they even went so far as to anticipate more stringent stream pollution laws by designing a more efficient water purification system.

Big Ingots—At the receiving end of the 2000-foot mill building, ingot drags arrive in the enclosed stripping area which is immediately adjacent to the soaking pits. M of the ingots are the 22 x 57-i size. After stripping, the ingots charged into the five-bay, one-v fired soaking pits.

From this point, until the in reaches the slabbing mill, all op ations are in control of the cr operator. After picking up an got for charging, crane moves proper pit, operator pushes a b ton in the cab, pit cover opens he charges the ingot. Another b ton closes the cover when crane is clear. No cover man n follow the crane, and considera savings in Btu's are realized v the shorter open time.

Remote Control Buggy—In moving an ingot from the pits, same procedure is followed v one additional operation. W ready for the ingot buggy, c operator pushes another bu which automatically brings motor-driven buggy to him, matter where it may be on the

Arthur G. McKee & Company provide the most experienced design, engineering, purchasing and construction services available to the Iron and Steel Industry in one organization.

McKEE experience is the result of almost half a century of designing and building facilities for every step of iron and steel production from raw materials to finished steel.

The successfully operating blast furnaces, open hearth shops, rolling mills, sintering plants and related facilities designed and constructed by Arthur G. McKee & Company in the United States and many foreign countries offer tangible proof of the value of *experienced engineering by McKee.*

The Iron and Steel Industry's confidence in our experience and ability is clearly indicated by the number of *repeat contracts* undertaken by this organization for satisfied customers who have found that *McKee engineering means assured results.*

McKee experienced engineering services are available to you to any extent you require. We invite your consultation on any iron or steel plant problem.

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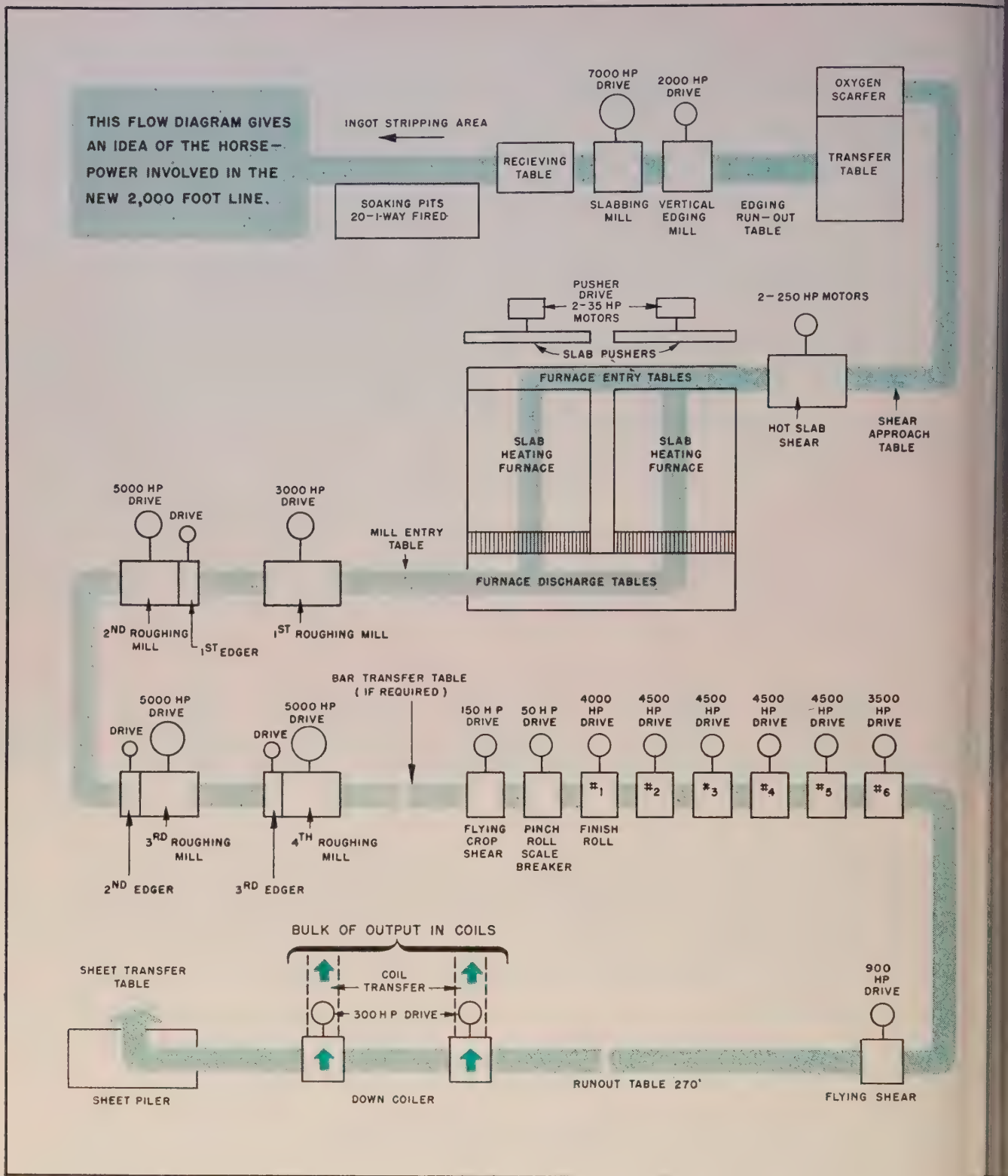

From that moment it will follow the crane wherever it goes until, loaded with an ingot, the crane operator sends it to the blooming mill receiving table.

Three cranes handle the work in the stripping-soaking pit area. Two 20-ton models service the soaking pits, and a larger capacity crane strips the ingots. Cabs of all three are air conditioned for comfort and safety of the operator, as are the other three which serve the rest of the line.

Control Intercom — Helping to maintain maximum co-ordination of all operations is an intercommunications system which links various control points along the line with crane operators and open-hearth lab. Thus an ingot can literally be talked down the line until it emerges as a finished coil.

Slab moves from final edg[illegible] via side transfer table, up to [illegible] oxygen scarfer which is on a [illegible] with the slab heating furnace [illegible] try. Two furnaces will handl[illegible] present slab heating, but space [illegible] been provided for building a t[illegible] furnace if capacity is ever ra[illegible] From the discharge end of the [illegible] naces, slabs slide down to [illegible]

Unequaled-anywhere!

IT ALL COMES DOWN to one fact... that Roebling high carbon flat spring steel is absolutely unequaled for cutting down preparation time, machine stoppages and rejects. What's more, it's made as you want it... annealed, hard rolled untempered; scaleless tempered; tempered and polished, blued or strawed.

You *pay* for the best every time you buy flat spring steel. Make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

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A subsidiary of The Colorado Fuel and Iron Corporation

California giant Sequoias—
largest of all trees.

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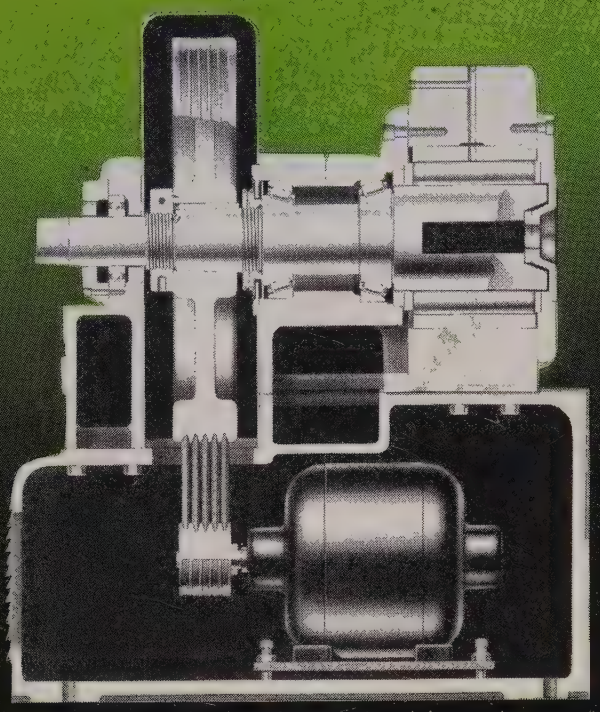
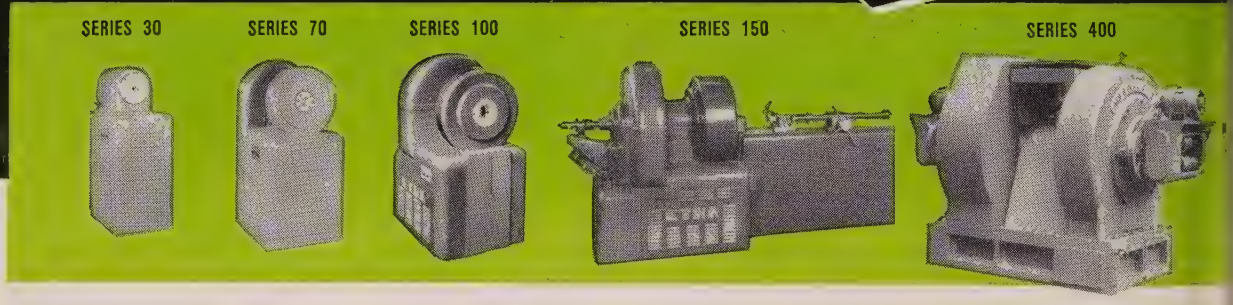
PHOTO BY MCMANUS

IF IT'S SWAGING... It's Etna..

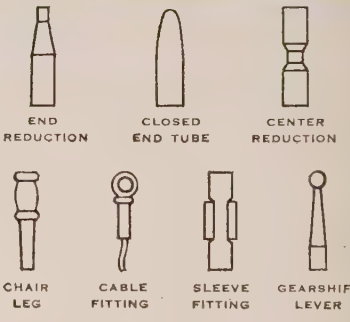
FOR CONTINUOUS PRECISION PRODUCTION!



A COMPLETE RANGE OF SIZES AND CAPACITIES



For tapering, sizing, reducing and forming to special shapes of round solids and steel tubing, the Etna Swaging Machine offers the ultimate in modern machine design. Regardless of size and description of the job to be done, there's an Etna swager right for *greater production*. Write today regarding your specific job problems.



It's New! Get full information on removal of I. D. Bead on steel and stainless steel tube with Etna Swagers resulting in mirror finish. Bead also removed on conduit.

Abbey ETNA Company

3402 MAPLEWOOD AVE., TOLEDO 10, OHIO

ntrast this old roughing mill at nland, with its hand-wheel screw- wns, with the new one shown below

ere is one of the roughing stands the new line. A 5000-hp motor, closed in a pressurized housing, owers the rolls, and all controls e either automatic or pushbutton

oughing mill entry table where ney once again proceed down the ne.

Dust-Proof Drives—Four stands -two 2-high and two 4-high—mprise the roughing mill. Three lging rolls are in the train, pre- eding each of the last three ands. An interesting feature is ne dust-proof housings for each f the driving motors. Resembling mall shanties, each is pressurized y blowers so all mill dust and at- nosphere is efficiently kept out.

Bar plate leaving the last stand s 5/8-inch or less depending on in- ot size, and it can either be sent n to the finishing mill or trans- erred off the line to be sheared for ther uses. Plate still on the line is squared up and moves through a flattener roll and spray descaler before entering the finishing mill.

METALS

Beryllium copper makes sensitive phonograph needles, sturdy record changer parts, reliable TV sets. This home entertainment center illustrates the wide use made of versatile Berylco. For parts and key numbers, see below.

A NEW WAY TO SOLVE OLD PROBLEMS

A proved design material, beryllium copper has enabled many difficult or "impossible" jobs to become standard production items

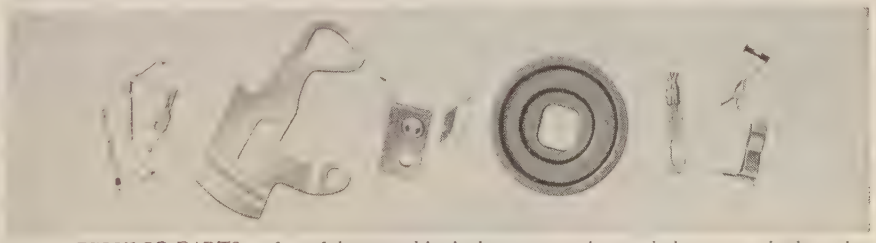
It took nearly a century and a half for the element beryllium to emerge from its position of obscurity in the laboratory, where it had been hidden since its discovery in the 1790s. In the last 20 years, however, it has written a brilliant commercial history as an alloy of copper.

Beryllium does wonders for copper. Through a simple heating process, for example, beryllium copper can be given the strength and hardness of ordinary steel. Yet it still retains a high degree of electrical and thermal conductivity.

The unique qualities of Berylco beryllium copper—its combination of strength and conductivity, its elasticity, its fatigue and endurance strength, its ready formability—have enabled manufacturers in nearly every industry to make better products cheaper. It takes only a glance at this home entertainment center—a far cry from the player piano in the 1910 parlor—to see how widely, and for what various reasons, Berylco has been used.

Beryllium copper is no longer a rare alloy. Domestic mining has reduced dependence on overseas sources. Production facilities have been enlarged. And manufacturers are fortunate in being able to draw on the scientific knowledge and practical know-how of the world's largest producer of beryllium copper. Write THE BERYLLIUM CORPORATION, Dept. 3F., Reading 19, Pa.

Tomorrow's products are planned today—with Berylco beryllium copper



THESE BERYLCO PARTS—a few of those used in the home entertainment industry—are in the order in which they appear in the large photograph: (1) phonograph needles; (2) record changer knife; (3) TV tuner clip; (4) camera baffle; (5) tube socket contact; (6) tuner clips.

Advertisement

unlimited *design* possibilities

FOR PARTS OF INTRICATE DESIGN UTILIZING A WIDE RANGE OF ALLOYS

MICROCAST PRECISION CASTINGS PROCESS

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The Microcast Process of precision investment casting opens new fields of design to the product development engineer. Virtually all ferrous and non-ferrous alloys can now be utilized economically in your product's design through the Microcast Process.
Design for little or no machining — for better parts at less cost — for longer life of parts, and for functional improvements from the use of better metals and alloys.

Microcast parts, as cast, are structurally sound, dimensionally uniform and smooth of surface. Consider this advanced process in your product designing. Write for booklet explaining Microcast Process and uses . . . also information about new Microcast color movie.

MICROCAST Complicated parts and components

Design to eliminate machining

MICROCAST DIVISION

austenal laboratories, inc.
224 East 39th St., New York 16, New York
7001 South Chicago Ave., Chicago 37, Ill.

Six stands of this mill are a 4-high and either 16 or 20-gag strip can be rolled off the las stand. Beta ray thickness gag keeps constant check on the strip and any variations are compen sated for in the final stands.

Runout and Coilers—Length o the runout table is 270 feet, com prised of 135 rolls with individua 5-hp drives. Flying shear at th roll end can be used either fo trimming strip ends or cuttin strip into sheets. At the other en are two downcoilers and beyon them, a sheet runout and pile Most of the output, however, wi be in the form of coils.

Cost of the complete job wa $35 million, and equipment alon was $19 million. As in the firs mill, United Engineering handle the design and installation of th line. Future construction schedule for the Ashland Division includes cold rolling mill, continuous an nealer, and a new Zincgrip line.

Snubbers Smooth Tank Rides

Sturdier and longer-lived shoc absorbers, which already hav brought smoother, steadier ridin to railway cars, have been adopte by the U. S. Army Ordnance D partment for its new Patton tank.

The tank shock absorber, snubber as it is called, is a un originally designed and develop by Chrysler Corp. engineers for th Chrysler-designed railroad freig car truck, adapted for mountin on tanks. It resembles the familia tubular shock absorber used o most automobiles, although it completely different in principle operation and much larger in siz

Tank or railway car snubbers d pend upon friction of a brake lini type of material, pressing again the inside surfaces of its steel tub to provide a constant snubbing a tion. This does away with the grea er complication of hydraulic sho absorbers and the problem, wh used in railway or tank service, their varying rates of snubbing a tion. Success of this snubber ty was attested when the U. S. Na recently put into service 8 special box cars for carrying a munition and fragile cargo at pa senger train speeds.

Acme Steel announces

revolutionary new advance in wire stitching

NEW ARCUATE WIRE STITCH
NEW
Acme Steel Arcuate Stitching forms flat wire into arc for greater strength.
OLD
Ordinary flat wire stitch has less holding strength than Arcuate Stitch of same wire size.
ORDINARY FLAT WIRE STITCH

In Acme Steel's new Arcuate stitching method, flat stitching wire is formed into an arc, increasing its column strength, making a smoother stitch with lighter wire, delivering up to 42% more stitches per pound of wire. Faster, too!

New Acme Steel Arcuate Stitching cuts wire costs 24 per cent

HERE'S HOW IT WORKS: Wire stitching has long been favored for assembling and closing of cartons of all types. Now "Stitching Headquarters"—Acme Steel Company—announces a new stitching method: Arcuate Wire Stitching.

In Acme Steel's new Arcuate Stitching method, regular flat stitching wire is formed into an arc by the stitching machine, making a stronger stitch so you can use lighter gauge wire for boxmakers' joints or any other stitching jobs. Increased column strength makes each stitch easier to drive. Stitches drive straighter, clinch better, hold tight.

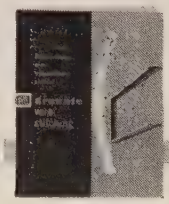
RESULT: You save 24% in wire costs. You get 42% more stitches from each coil of wire (using .103 x .014-inch instead of .103 x .020-inch wire, for example). Arcuate Stitching virtually eliminates machine jamming—reduces down time and produces perfect stitches more consistently. This means that you can stitch more cartons per day, and get a better-looking carton every time.

It's easy to adapt your present equipment. There are conversion parts-kits for most popular model stitching machines.

CALL your Acme Steel representative for all information. Or, for a free folder giving complete details and a stitched sample, write to Acme Steel Products Division, Dept. S-63, Acme Steel Company, 2840 Archer Ave., Chicago 8, Illinois.

FREE →

Get the details . . . send in the coupon for a free folder on Acme Steel's new Arcuate Stitching.



ACME STEEL CO., Dept. S-63
2840 Archer Ave., Chicago 8, Illinois

Please send me free copy of your new folder on Arcuate Wire Stitching and a stitched sample.

*Name*_____

*Company*_____

*Street Address*_____

*City*_____ *Zone*____ *State*_____

ACME STEEL

STITCH IT . . . STRAP IT . . . SHIP IT . . . SAFELY!

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for short handed plants
Fewer hands move more materials faster when a Conco Crane provides the "muscle." That means lower costs. Write today for Bulletin 3000A covering the full line of Conco Cranes, Hoists, Trolleys — each backed by 36 years experience.
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Electronics Reliability

Lack of it is still the block to greater industrial usage, AIEE told by GE engineer

WITH a substantial increase in the use of electronic equipment in industry, the need for greater emphasis on reliability is increased, the summer general meeting of the American Institute of Electrical Engineers was told at Atlantic City, N. J.

This reliability must be not only in the electronic component itself but in design, installation, maintenance and service, Ellsworth D. Cook, General Electric Co. engineer, said in a paper entitled "Reliability in Industrial Electronic Equipment."

Parts Shortcomings—"Since sufficient improvement in component reliability has not yet occurred which automatically would permit a major improvement in equipment reliability," he said, "engineers must use such expedients as their combined experience shows to be helpful. These are the simple, common-sense, but totally unromantic methods of established good engineering practice in design, installation, maintenance and service. What must concern engineers for the present, therefore, is the continued emphasis on these practices and further extension of their use.

While the above mentioned are important, Mr. Cook believes that most emphasis must be placed on good design; first of the component and second of the equipment. However, because the methods cited for the equipment as a whole have a limited effectiveness, emphasis must be given to the encouragement by word and other support to the component manufacturers in efforts to improve the reliability of their products.

Teach Old Employees New Skills

Revised edition of "Your Skill Improvement Program" has been issued by the U. S. Department of Labor's Bureau of Apprenticeship.

This 16-page booklet, designed to help the employer develop a skill improvement program, contains a check list for the employer's use in making spot evaluations of his current training system and training needs.

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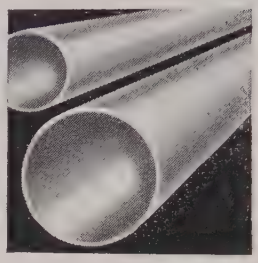
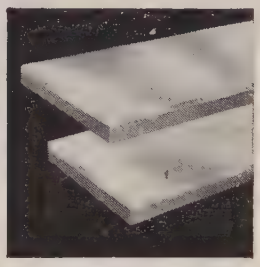
New, modern equipment—including vertical edger . . . hot shears . . . slabbing furnace . . . annealing furnace . . . are now in full operation producing Claymont Steel Products.

They're enabling us to maintain our traditional quality standards and personalized attention to your needs—while at the same time improving our service to you.

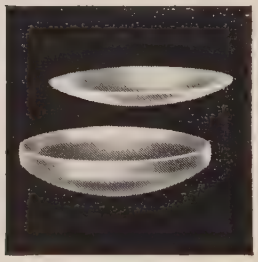
Let us know your requirements.



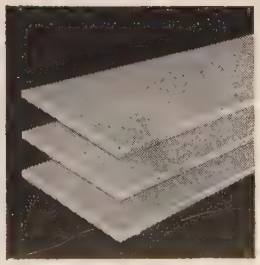
Large Diameter Welded Steel Pipe



Stainless-Clad Steel Plates



Flanged and Dished Heads



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A few of the many forms of Disston Hot Rolled Shapes now being used in industry.

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It may be money-saving news to you that Disston can relieve you of much of the overhead in machining by delivering Disston Hot Rolled Steel Shapes to meet or closely approximate your specifications. These steel- and labor-saving shapes can be rolled in a variety of forms that should easily offer production short-cuts to you. Tolerances are close, and finishes are exceptionally fine. Disston Shapes can be made in either alloy or carbon steels, both electric and open hearth grades. Disston engineers and metallurgists are ready to work with you today. Write us, giving your needs.

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626 Tacony, Philadelphia 35, Pa., U.S.A.

espirators Must Be Used

Proper weight and easy maintenance are two keys to selling men good practice

ETTING employees to use respirors when and where they need em is a common problem in many dustries. Typical of good practice this score is Richmond Radiator . at its Monaca, Pa., plant. Wear- respirators is mandatory in rtain operations, encouraged or rmitted elsewhere at the indidual's option. Equipment is mainined effectively on a co-operative sis.

Major products of the Monaca ant are porcelain-enameled cast on plumbing fixtures, from castg through finished units. In undry work, respirators are proded, but not required equipment r employees. However, several her jobs carry an inflexible rule

PROTECTION IN SLUSHING
. . . employee attitude is excellent

equiring respirator use, notably rinding, slushing and chemical eighing.

Practical Approach — Despite horough employee indoctrination n need for wearing respirators on hese jobs, the firm realizes there would be exceptions unless it is nade simple and convenient. Two actors were comfort of equipment nd practical maintenance.

Where comfort is concerned, an important consideration must be ight weight. An ill-advised but unerstandable tendency for a tired nan to remove a respirator before he should results usually from unecessary weight. The company is atisfied its standardized model, he MSA Dustfoe 55, fills requirements for an extremely lightweight and compact unit. Total weight: 2¾ ounces.

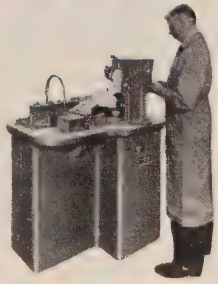
Throw-Away Filters—Other advantages include unobstructed downward vision and minimum breathing resistance. Simple design and construction hold down maintenance requirements. Men are encouraged to change static web throw-away filters whenever they think necessary. The average is twice each work day.

Each man keeps his own respirator, exchanging for a new or rebuilt unit when he finds it advisable. Plant maintenance cleans, rebuilds, sterilizes and applies paint as needed. Balanced inhalation valves on the Mine Safety Appliance Co. masks are installed or removed easily. Filter edges are exposed to observation for positive pressure seal, and positioning pins assure proper filter seating.

Result of the right equipment and strong company policy: Employee attitude makes it everybody's job to eliminate or reduce health hazards on these jobs.

Hartford Special Automatic Thread Rollers feature completely automatic hopper feed, vibration free operation and quick and easy setups. Model A-312-H above rolls screws from No. 6 (.138) thru 5/16" diameter with thread lengths up to 2½". Smaller model A-190-H rolls screws from No. 2 (.086) thru No. 10 (.190) with thread lengths up to 1½".

For complete information send for Bulletin TR.



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ABRASIVE CO.

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Write for free data book and name of your Simonds distributor.

SIMONDS ABRASIVE CO., PHILADELPHIA 37, PA. BRANCH WAREHOUSES: CHICAGO, DETROIT, BOSTON

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Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N.Y. Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

Rusting Away

A metallurgy and corrosion expert has flown to Reykjavik, Iceland, on an unusual mission for the Icelandic government. Sam Tour & Co. Inc., research and testing consultants, have been retained by the Icelandic government to investigate means of preventing corrosion in municipal heating systems which derive their heat from underground hot water springs.

Many homes and buildings in four of Iceland's major communities, including the capital, Reykjavik, are heated with hot water pumped from underground springs. The hot water, at an average temperature of 190° F, is distributed through a publicly-owned system of reservoirs, piping and pumping facilities.

Drawback—However, severe corrosion has occurred in the piping and radiators of these systems. The experts have been called in to inspect the systems, determine the cause of corrosion, and suggest remedial measures. In addition to studying the local conditions affecting the hot water systems, they will collect specimens from various parts of the systems for additional study in the company's laboratories in New York.

Organic Laboratory Opens

Dow Chemical Co., Midland, Mich., announces opening of its new Edgar C. Britton Research Laboratory, named in honor of its Organic Research Laboratory director. Naming of the laboratory was revealed by Dr. Leland I. Doan, Dow president, at a joint meeting of the company's General Research Committee and the organic research laboratory staff.

The laboratory, with total floor area of 42,000 square feet, has eight six-man research laboratories and two three-man laboratories. Facilities are available for 100 workers, including a technical staff of 60.

Dr. Britton has been a member of the Dow organization since 1925 and director of its organic research laboratory since 1932. Among the many organic chemical processes which have come under his study are those for phenol, aniline, phenyl-phenols, butadiene, phenothiazine and tryptophan.

Huge Terminal Building at World's 2nd Largest Airport

By AMERICAN BRIDGE

Interesting Facts

Airfield is 2nd Largest in World.

Terminal Building is Largest in World.

The terminal building provides facilities of a small city, including a 62-room hotel, a restaurant to accommodate 3000, numerous shops.

Designed by: Allegheny County Department of Aviation.

Owner and Operator: Allegheny County Department of Aviation.

Architect: Joseph Hoover, Pittsburgh.

Consulting Engineer: L. W. Cook, Pittsburgh.

Structural Steel Fabricated and Erected by American Bridge: 4,000 Tons.

AILABLE NOW! *For showing in churches, schools, clubs l industries, the new sound and color motion picture— ILDING FOR THE NATIONS—a candid, factual otographic record of the highlights of the fabrication and ction of the United Nations' Secretariat Building.*

4,000-Ton steel framework fabricated and erected for 460-ft. semi-circular 7-story Administration Bldg. and 578-ft. Loading Dock

THE new thirty-three million dollar Greater Pittsburgh Airport, opened in June 1952, is an impressive sight. Its sixteen-hundred acre airfield is the second largest in the world . . . larger even than Washington's National Airport and New York's LaGuardia Field combined!

But, as impressive as is the airfield itself, it is overshadowed by the spectacular Administration Building. This seven-story, semi-circular structure with its long loading dock is easily the world's largest terminal building.

American Bridge fabricated and erected the 4,000-ton steel framework for this huge structure which is 460′ feet in breadth at its widest point, and with its 578-ft. loading dock has an over-all length of 979 feet. Nine months after the erection crew took over, the last rivet was driven.

This huge building is another example of American Bridge engineering and fabricating "know-how". And it is your assurance that you can depend on American Bridge to handle any type of steel-frame construction with thoroughness and speed . . . any time . . . anywhere. If you would like to know more about the advantages of American Bridge fabricated and erected construction, call our nearest office.

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AMERICAN BRIDGE

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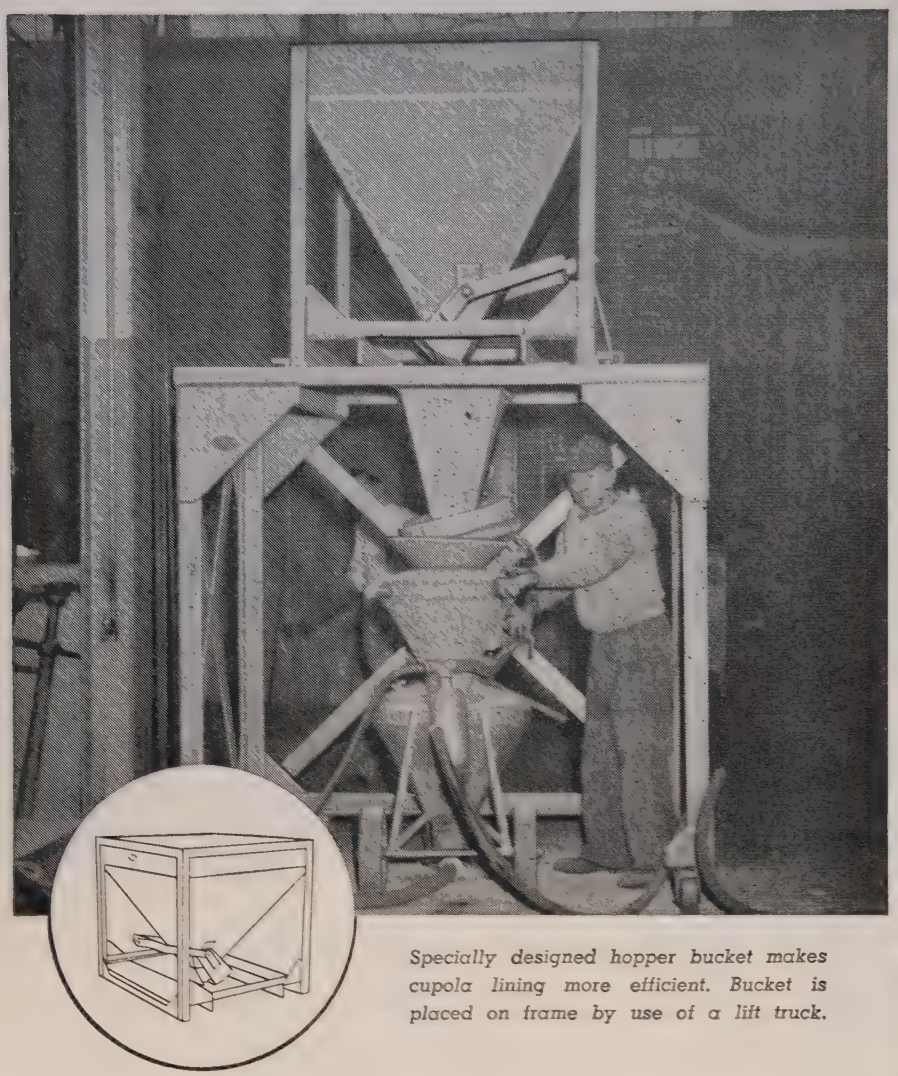
UNITED STATES STEEL



Specially designed hopper bucket makes cupola lining more efficient. Bucket is placed on frame by use of a lift truck.

Solve Your Material Handling Problems With **PENN IRON SPECIAL EQUIPMENT**

In lining cupolas, Textile Machine Works foundry in Reading, Pennsylvania, had difficulty handling the clay mix used with their Bondactor equipment. After a study of the problem, Penn Iron Works, Inc., designed, engineered and manufactured this special hopper bucket for maximum handling efficiency.

Whatever the bulk-material handling problem in your plant, Penn Iron Works, Inc., will be glad to help with its solution. Our wide experience in designing and manufacturing all types of buckets and special handling equipment for foundries can help you cut costs . . . save time . . . increase efficiency.

For Further Information Write:

PENN IRON WORKS, INC.
READING, PENNSYLVANIA

Ti Facts for Small Plants

LEAFLET explaining some of the properties and uses of titanium issued by Small Defense Plants Administration is designed to acquaint the small manufacturer with general information about this metal which is finding increased use as an alloy in a great number of metal products.

Copies of the leaflet are available free on request from SDPA field offices.

Credits—Under "General Characteristics," the leaflet has this to say about titanium's prospects for expanded application:

"Titanium is becoming a valuable addition to the established list of structural metals. Some of its characteristics which make it attractive to the metalworking industry are:

"Good strength ratio, which is maintained up to about 1000°F and its endurance limit-ultimate strength ratio is unexcelled; yield strength is as high as that of better grades of steel; ductile enough for many forming operations; excellent corrosion resistance; flame impingement tests do not affect it."

Debits—Leaflet also cites disadvantages of using the metal, contains a table listing the composition of the more common titanium alloys, explains the corrosion resistance properties of titanium and gives information that deals with various machining and forming operations.

Screw Thread Manual Ready

Handbook, recently published by the American Society of Mechanical Engineers, is the culmination of 50 years of argument, conference and compromise. Titled "ASME Screw Thread Manual," it is a shop and drafting room abridgement of the American and Unified Standards for screw threads and their gages.

The volume contains the American standards and those that were set by the Accord of 1948 signed by Canada, Great Britain and the United States. The agreement was designed to assure the interchangeability of screws and threaded products of those nations. Copies are available from society offices 29 W. 39th St., New York 18.

CALENDAR
OF MEETINGS

15-18, Radio-Television Manufacturers Association: Annual meeting, Palmer House, Chicago. Association address: 777 14th St. NW. Washington 5. Secretary: James D. Secrest.

15-18, American Electroplaters' Society: Annual meeting, Benjamin Franklin hotel, Philadelphia. Society address: 445 Broad St., Newark, N. J. Secretary: D. Gordon Bulke.

15-19, Basic Materials Conference and Exposition: Grand Central Palace, New York. Information: Banner & Greif, New York 19.

15-19, American Institute of Electrical Engineers: Summer general meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

16-19, American Welding Society: National spring technical meeting & welding and allied industry exposition, Shamrock hotel and Hall of Exhibits, Houston. Society address: 33 W. 39th St., New York 18. Secretary: J. G. Magrath.

17-19, American Management Association: General management conference, Hotel Statler, New York. Association address: 330 W. 42nd St., New York.

18-20, American Society of Mechanical Engineers, Applied Mechanics Division: Applied mechanics conference, University of Minnesota, Minneapolis. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

22-25, National Industrial Advertisers Association: Annual meeting, William Penn hotel, Pittsburgh. Association address: 1776 Broadway, New York. Executive secretary: Elaine G. Wiley.

22-27, Railway Supply Manufacturers Association: Exhibit and convention, Atlantic City. Association address: 60 E. 42nd St., New York 17. Secretary: A. W. Brown.

28-30, Alloy Casting Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 32 Third Ave., Mineola, L. I. Y. Secretary: E. A. Schoefer.

28-July 2, American Society of Mechanical Engineers: Semi-annual meeting, Hotel Statler, Los Angeles. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

29-July 3, American Society for Testing Materials: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society address: 1916 Race St., Philadelphia. Secretary: Robert L. Painter.

6-17, Summer Course in Product Design: Massachusetts Institute of Technology, Cambridge 39, Mass. Information: Director of Summer Session, Room 3-107, MIT.

23-24, Truck-Trailer Manufacturers Association Inc.: Annual summer meeting, Edgewater Beach hotel, Chicago. Association address: 1024 National Press Bldg., Washington. Managing director: John B. Hulse.

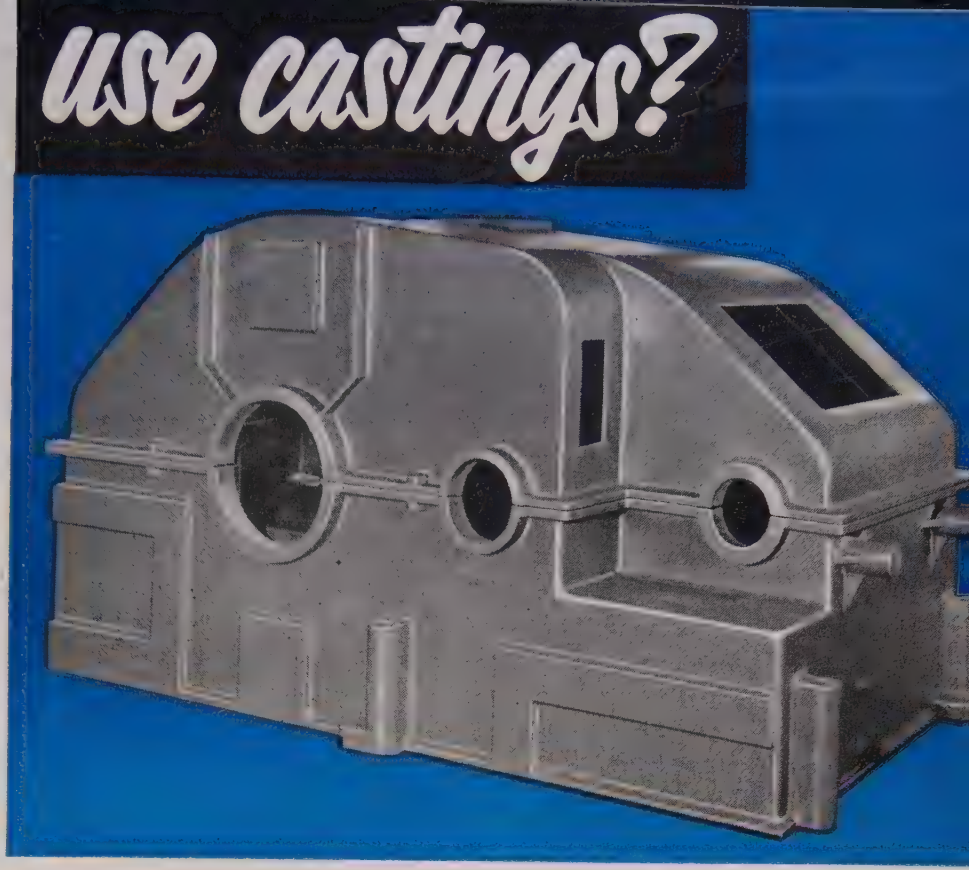
August 17-19, Society of Automotive Engineers: International West Coast meeting, Georgia hotel, Vancouver, B. C. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

August 23-26, National Automatic Merchandising Association: Annual convention and exhibit, Hotel Conrad Hilton, Chicago. Association address: 7 S. Dearborn, Chicago. Secretary: C. S. Darling.

September 1-4, American Institute of Electrical Engineers: Pacific general meeting, Hotel Vancouver, Vancouver, B. C. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

September 6-11, American Chemical Society: Fall meeting, Hotel Conrad Hilton, Chicago. Society address: 1155—16th St., NW, Washington 6. Assistant Secretary: R. M. Warren.

September 13-16, Electrochemical Society Inc.: Fall meeting, Ocean Terrace hotel, Wrightsville Beach, N. Carolina. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.



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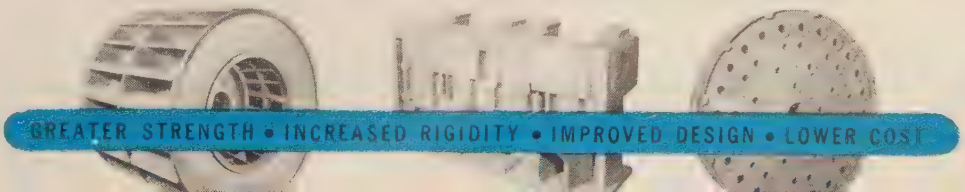

World's largest builders of world's largest cranes

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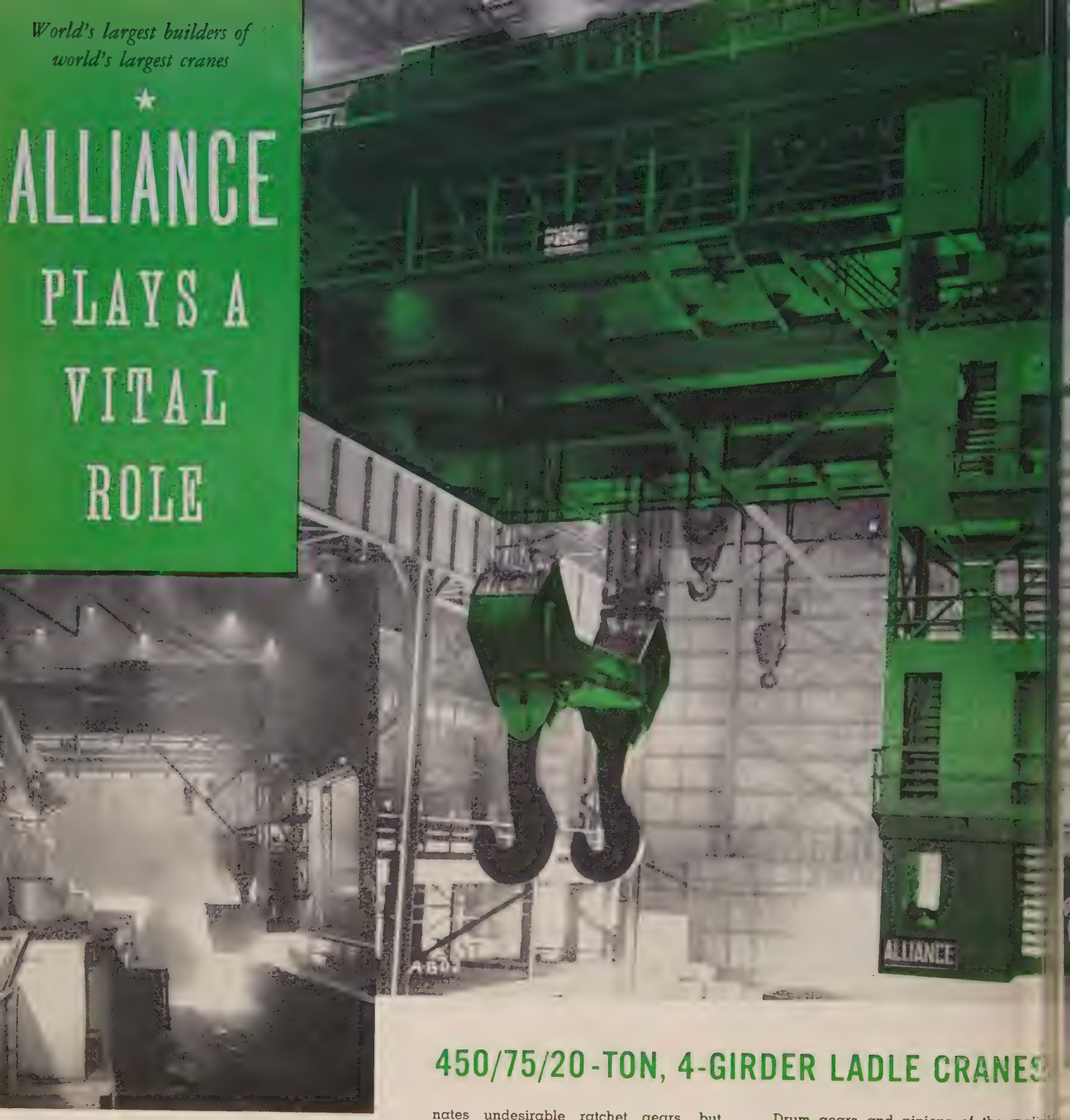
ALLIANCE PLAYS A VITAL ROLE



450/75/20-TON, 4-GIRDER LADLE CRANES

When the engineers from the Construction Engineering Bureau of the United States Steel Corporation were in the market for the world's largest ladle cranes for Fairless Works, they consulted The Alliance Machine Company, whose experience and know-how qualified them for this important task.

One of the cranes Alliance designed, which is now operating in the Fairless Works, is this 450-ton ladle crane. Having a 69'6" span, this crane is equipped with a 2-motor, synchronized worm drive and double-drum interlocked type main hoist. The synchronizing shaft employed in the gearing scheme not only eliminates undesirable ratchet gears, but makes possible an additional safety feature in case one hoist motor fails. Under this condition, both worms are driven by the remaining motor. All gearing functions continue as though operated with two motors. In case of hoist motor failure on the conventional drive **without** the synchronizing shaft, hoisting is accomplished by **only one** set of gears, thus imposing a double load on active gearings, as the second drum is then driven through interlocking drum gears.

Hoist gearing is so proportioned that full crane capacity can be lifted by one motor without exceeding the quarter-hour rating.

Drum gears and pinions of the main hoist have precision-cut, single-helical teeth. This feature, in cooperation with the worm drive, provides vibrationless operation on either high- or low-speed hoisting and lowering.

All gears of this new Fairless Works crane are fully enclosed and operate in a bath of oil, assuring long life and low maintenance. The 4-part safety rope system affords the highest degree of safety in rope reeving.

This crane is equipped with a 5-story cab, the operator's compartment being air-conditioned.

Consult Alliance Machine Company engineers when you have a heavy material handling problem.

★ ★

THE Alliance MACHINE COMPANY

MAIN OFFICE
ALLIANCE, OHIO · PITTSBURGH OFFICE
1622 OLIVER BUILDING, PITTSBURGH, PA

NEW PRODUCTS and equipment

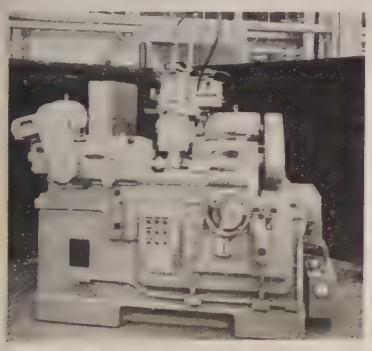
Reply card on page 123 will bring you more information on any new products and equipment in this issue

Semiautomatic Piston Grinder

. . . 6 x 8-inch packaged unit

This piston grinder, a 6 x 8-inch semiautomatic machine, can be specially arranged for work on complex skirts where degree of relief varies from top to bottom. A complete packaged unit, the machine is heavily-built with cam generating mechanism designed to give special motion to the workpiece for grinding required skirt form.

Contributing to machine's productivity is fast, precise action obtained from hydraulically-actuated and revolving screw wheel feed mechanism. Little actual operating effort is required to run the



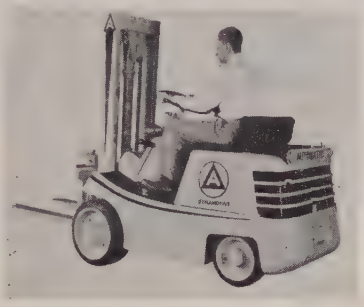
machine. This allows the operator to devote a major portion of his attention to loading and unloading. Automatic grinding cycle is started by movement of the spindle lever. Norton Co., Dept. ST, Worcester 6, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Gas-Powered Electric

. . . constant peak power

Gas - powered, electric - driven truck, the Dynamotive, provides traditional performance and cost characteristics of electric types, plus constant power source derived from a gasoline engine. Its electric infinite-step transmission has no mechanical connections from engine to drive unit. This eliminates transmission gears and need for



hydraulic torque converters or overdrive mechanisms. Infinite acceleration range with minimum power loss means maximum efficiency.

Greater safety and driver comfort result from these styling features: Greater vision from driver's seat; full-size bench-type seat and extra leg room; centralized controls. Rear contours are shortened.

For servicing, hood hinges forward disclosing entire engine compartment. Load indicator that shows weight of material on forks at any time is optional. Capacities range from 4000 to 6000 pounds. Automatic Transportation Co., Dept. ST, 149 W. 87th St., Chicago 20, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Aluminum Cleaner

. . . doesn't etch or discolor

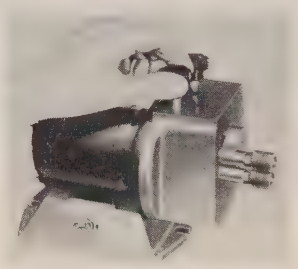
Alkali compound that will not etch or discolor aluminum is sufficiently powerful to spray wash the most difficult types of heavy cleaning. Compound is nontoxic, nonflammable and has rust-preventing action on ferrous parts after washing. Manufacturer reports Vantrol 5541 has been tested successfully as an in-process spray washer-type cleaner on both ferrous and nonferrous metals. Van Straaten Chemical Co., Dept. ST, 546 W. Washington Blvd., Chicago 6, Ill

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Wheel-Type Wire Stripper

. . . built-in space regulating

Model R-1 Midget wheel-type wire stripper is built for high production film insulation stripping from fine magnet wires. A built-in space regulating screw limits minimum spacing between wheels, pre-



venting wire breakage or reduction. Pressure regulator allows wheels to separate as the wires enter, brings them back to fixed position for complete stripping. Rush Wire Stripper Division, Eraser Co. Inc., Dept. ST, 1068 S. Clinton St., Syracuse 4, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Portable Industrial X-Ray

. . . fits into auto trunks

Norelco portable MG 160 x-ray unit is built specifically for rapid inspection of welds, pipe lines, power plant and aircraft equipment. The unit weighs 143 pounds, is sufficiently compact in design to fit into the trunk of an automobile. X-ray tube head also contains high tension generator of 150,000-v output. Accompanying control is equally compact, weigh-

ing 80 pounds. Arrangement of tube and generator in one housing eliminates need for high-tension cables.

Tube is fan-cooled, has end port that provides maximum usefulness

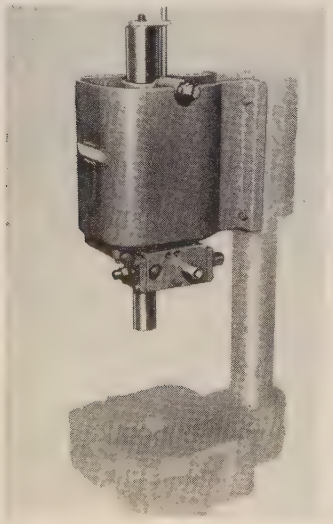
in handling various types of close-in work. Non-Destructive Testing Division, North American Philips Co. Inc., Dept. ST, 750 S. Fulton Ave., Mt. Vernon, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Impact Hammer

. . . mounted at any angle

Made available as a separate unit, the head of this model Z-2, 12,000-pound impact hammer can be mounted at any angle or upside down to handle difficult operations. Operated at 100 psi line pressure, the model hits 50 strokes per cubic foot of air at a rate of



60 strokes per minute when operated by either hand or foot control. Automatic operation, by addition of solenoid valve or guide-rod switches, increases speed to 120 strokes per minute.

Impact is constant at any point during stroke after adjustment to any pressure up to hammer capacity. Variations in stock thickness or improper positioning are handled without damage to work, dies or hammer. Air-Hydraulics Inc., Dept. ST, 239 Belden Rd., Jackson, Mich.

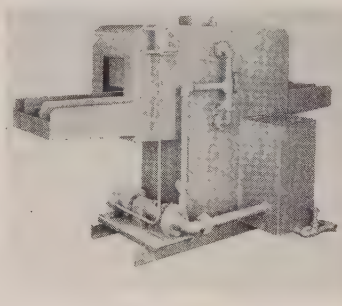
FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Small Parts Washing Machine

. . . flexibility marks design

This parts washing machine is built for low production jobs or for cleaning between operations. Tank and cables are arranged so two units can be teamed for wash and rinse operation. Wheel roller conveyor is designed for standard work baskets.

Same unit can be furnished with the manufacturer's special Niagara wheel paddle instead of a



pump. The latter arrangement is excellent for screw machine work where a substantial amount of chips must be removed when the job calls for large solution volume at a low head. Standard unit can be furnished for steam, gas or electric heat. G. S. Blakeslee & Co., Dept. ST., 1822 S. 52nd Ave., Chicago 50, Ill.

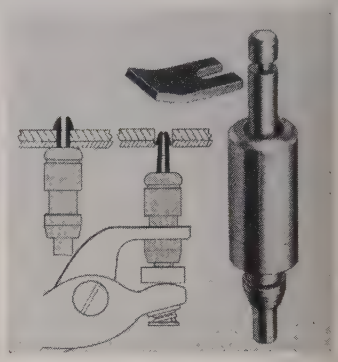
FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Sheet Metal Fasteners

. . . align under pressure

Metal or hard surface parts containing drilled or punched holes can be held together temporarily in alignment and under pressure by these quick acting sheet metal fasteners. Units will hold combined materials as much as 4 inches thick. Tools hold materials such as templates, jigs, sheet metal and small fittings in place during drilling, riveting, fabrication and assembly. For temporary fastening, they can be a timesaver by replacing bolts and nuts. They are applied from one side of th work and can be used many time

Fasteners of both spring an



hand actuated wing nut type ar available in a variety of sizes an capacities. Wedgelock Co., Dept ST, 5446 Satsuma Ave., N. Holly wood, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Liquid Carburizing Furnace

. . . capacities to 1700°F

This liquid carburizing furnac is capable of operating tempera tures to 1700°F. Alloy pot is 1 inches diameter, 24 inches deep

Furnace is heated by four burn ers positioned to fire the pot tan gentially. Overall furnace heigh is 40 inches, same height as com bination oil and water quenc tank. Waltz Furnace Co., Dept ST-9, 1901 Symmes St., Cincinnat O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Diagonal Shaving Machine

. . . gear tooth crowning added

Gear tooth crowning by conven tional method of rocking the ma chine table during shaving cycl is a feature added to the Red Ring model GCU shaving machine While crowning on this machine previously required a speciall formed cutter, it can be done with any standard rotary cutter whil

Aircraft engine heat deflector

Cream separator bowl base

...ON THE FARM

...stainless castings cut costs

Considerable savings in both material and machining time are effected when Crucible Stainless Steel Sand Castings are used. And here are two good examples.

The heat deflector — which protects vital turbine assembly parts in an advanced model aircraft engine — was cast by Crucible from AMS-5363A (Type 347) stainless . . . in conformance with rigid aircraft quality standards. Previously this part had been completely machined from a solid forging. The cast part performs the same job, but at a substantial saving in manufacturing cost.

The bowl base for a dairy cream separator was cast by Crucible from CF-20 (Type 302) stainless. To permit fast and efficient finishing in automatic machine tools, the casting must be held to close tolerances. Also, it has to be free from porosity, shrinkage, gas holes, inclusions or any defects that in the finished part would interfere with cleanliness or violate food laws.

Both the heat deflector and the bowl base applications exemplify how steel and machining time may be saved by using a stainless steel casting instead of machining from bar stock or a forging. If you make a product that must resist corrosion, consult Crucible regarding the advantages of producing it from a stainless sand casting.

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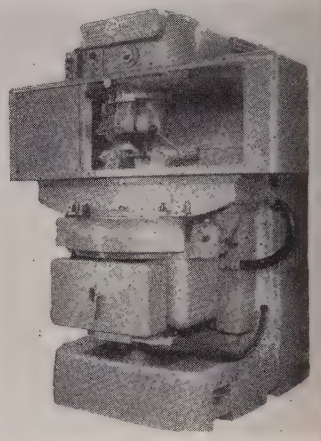
REPUBLIC RUBBER DIVISION

LEE RUBBER & TIRE CORPORATION, YOUNGSTOWN 1, OHIO

INDUSTRIAL RUBBER PRODUCTS

the work gear is being recipro-cated in line with its axis.

Point of maximum crown, usually at tooth center, can be shifted either way by changing position



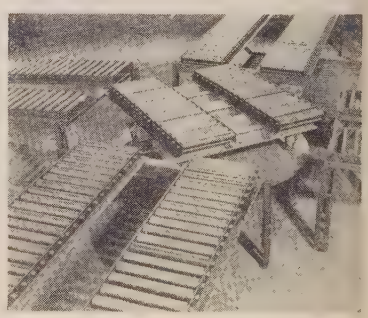
of work gear with reference to that of cutter. When gear teeth spur or helical must be shaved without a crown, crowning cam is disengaged. Pivoted table also offers possibility of shaving gear teeth to a predetermined taper. National Broach & Machine Co., Dept. ST, 5600 St. Jean Ave., Detroit 13, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Conveyor Turntables

. . . switching at any angle

This turntable line is used with the manufacturer's roller and gravity wheel conveyors. Turn-



tables permit products conveyed on straight sections to be switched

USE A REPLY CARD

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Yours FOR THE ASKING

TEAR OUT CARD, FILL IN and MAIL TODAY

68. Gas/Air Inspirators

Hauck Mfg. Co. — Catalog 806A describes a line of gas/air inspirators and boosters for industrial ovens, furnaces etc. Units are available for natural, mixed, and manufactured gases. Full ordering information and tabular performance data are given.

69. Forcefeed Lubricators

Hills-McCanna Co. — Force feed lubricators for all types of machinery in enclosed and open types are described in 16-page catalog L-52. Units are available in capacities from 2 to 32 pints and with 1 to 24 feeds. Catalog describes construction and operating features fully, and gives specifications and prices.

70. Endless Belt Filters

Industrial Filtration Co.—Industrial application of Delpark endless belt type filters and disposable type filters are depicted in 8-page illustrated folder. Info on sizes, capacities and performance characteristics is given, along with specs, ratings and dimensions.

71. Ground Flute Reamers

Lavellee & Ide, Inc.—40-page catalog 53 has specifications and illustrations for wide range of standard ground flute reamers, plus an alphabetical index for quick reference. Supplementary net price list is illustrated and indexed.

72. Stacking Racks

Palmer-Shile Co.—Bar and coil racks are described in photo-caption style on new data sheet showing working applications and construction. This equipment is designed for one-man operation.

73. Heat Resistant Castings

International Nickel Co.—48-page manual "Heat Resistant and Corrosion Resistant Alloy Castings in Industry" is a well-compiled bulletin with over 175 illustrations. Typical compositions, their applications, limitations and types of suitable service are discussed. Charts compare creep strength, and tables show classifications.

74. "Moly" Lubricant

Bel-Ray Co.—"Anti-Seize", a new molybdenum disulfide lubricant, is described in 4-page bulletin. Product is a multi-purpose lubricant which will prevent seizing and galling at pressures over 100,000 psi and from sub-zero temperatures to 750° F. Illustrated applications are shown.

75. Boiler-Burner Units

Kewanee-Ross Corp.—Full description and complete data on entire line of Kewanee-Iron Fireman boiler-burner units are found in 12-page illustrated bulletin 2314. Units are applicable to high or low pressure heating, power or process steam and use oil, gas, or oil-gas combination for fuel.

76. Conveyors & Accessories

Standard Conveyor Co.—"Modern Time & Cost Savers" is title of 28-page illustrated bulletin 63-C on standardized gravity and power conveyors and accessories. Also covered are portable belt conveyors and belt elevators. Much general info, specifications and operation data are included.

77. Arc Welding

Hobart Brothers Co. — Gasoline driven arc welders are described in 8-page folder. Two 250 and two 300-amp models are featured, one of which has a 3-kw dc auxiliary power outlet. Trailer mounted units are also described. Complete electrical and mechanical specifications are given.

6-15-53

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78. Plant Layout

"Visual" Planning Equipment Co. —16-page technical report gives a graphic analysis of the best types of equipment and methodology for successful plant layout. An independent report, it includes relative costs and merits of four different methods.

79. Pressure Welding

Koldweld Corp.—Engineering bulletins on the Koldweld process are now available. Process will weld a wide size and shape variety of either similar or dissimilar metals economically with low-cost tools. Explanation of the process and typical applications are shown.

80. V-Link Belting

Brammer Corp.—Sizes and prices; advantages of V-link belts compared with endless V-belts; Brammer V-link versus other detachable V-link belting; selection table with power correction factors; and assembly, installation and maintenance instructions are covered in data book 205.

81. Vibration Control

Felters Co. — 20-page illustrated booklet tells "Why It Pays to Anchor Your Machines with Unisorb." Material controls vibration and noise. Booklet covers installation, materials, and applications.

82. Dry Gasholder

General American Transportation Corp.—You can read all about "The Dry Gasholder with a Heart as Strong as Its Body" in 12-page illustrated bulletin WG-22. Wiggins gasholder is described and its construction features are shown.

83. Box Muffle Furnaces

Burrell Corp.—Five different models of box muffle laboratory furnaces are described in 4-page bulletin 315. Information given includes temperature ranges, features, dimensions and prices. Photos show new floor-mount and easy-access panel design.

84. Stainless Steel Fittings

Cooper Alloy Foundry Co.—Series of data sheets describe and illustrate Quikupl stainless steel fittings for use on pipe or tubing without threading or welding. Specs of fittings, a cluding elbows, tees, couplings, ducers and adapters are given.

85. Sand Control

Claud S. Gordon Co.—"Taking Mystery out of Foundry Sand C trol" is title of 32-page booklet. covers selection, physical propert correction of defects and testing r ommendations.

86. Tube & Bar Stock List

Peterson Steels, Inc. — Compl stock listing of No. 52100 chro steel bars and tubing is presented 12-page bulletin. Graph on ba cover shows relative hardenability the three different analyses listed.

EDITORIAL ARTICLES
Available in Limited Quantit

87. Enameling Steels

Shortages of practically all ty of steel and iron sheets best suit for enameling is forcing enamel to use whatever is available. So substitutes hold promise. M. Gibbs and F. R. Porter present so relative facts in STEEL repr "What Steel for Enamelers?"

88. Portable Tools

There are so many portable to that can do a good job that pick the best one is often a problem. D sign, speed and power, the chief co siderations in selecting these to are discussed in STEEL repri "Right Portable Tool Means creased Production."

89. Steelmaking Progress

In STEEL reprint "Iron Not Used to Blow-In Blast Furnac highlights of papers given at 36 conference of American Institute Mining & Metallurgical Enginee are presented. Papers show how a plying blast through taphole reduc blow-in time and how combining dr in-out and blowing-in periods sav time and conserves refractories.

90. Plant Pre-Planning

Co-ordinated process engineeri and architecture gives Binks M Co.'s new sheet metal plant a hi score in economy of maintenance a operation. Overcrowding is thing the past. How it was done is r lated in STEEL reprint "Pre-pla ning Doubles New Plant's Output

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...t any angle, or to pass straight ... cross, increasing flow flexibility. ...ections are mounted on large ...asters that turn on a circular flat ...teel plate. A built-in lock ar...angement holds rotating sections ...igidly at desired angle.

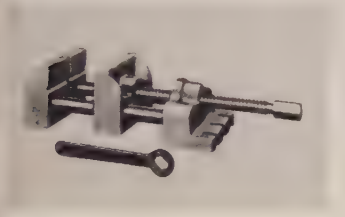
Turntables are built for all ...idths of rollers, wheel arrange...ments, frames and couplings avail...ble in the firm's standard line. ...age Equipment Co., Dept. ST, 31 ...Essex St., Buffalo 13, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

...ress and Machine Vise Line

. . . 3 to 6-inch jaw widths

Complete drill press and machine ...ise line is available in 3, 4½ and ...6-inch jaw widths. Tools are built ...o close tolerances, with accent on ...imple line to eliminate dead ...weight. Main parts are cast of gray



...iron and vises are fitted with preci...sion-cut Acme spindle.

Since all sides are fully ma...chined, they can be used flat (illus...trated) or on either side, eliminat...ing need for removing workpieces. To clamp rounds, jaws have ver...tical and horizontal V grooves. Re...movable hardened steel jaw plates ...are optional. Wilton Tool Mfg. Co., Dept. ST, 925-941 Wrightwood Ave., Chicago 14, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Cold Pointing Machine

. . . nonrevolving, stationary dies

This machine is built in four sizes for cold pointing steel and nonferrous tubes and bars up to 6 inches in diameter. Four dies

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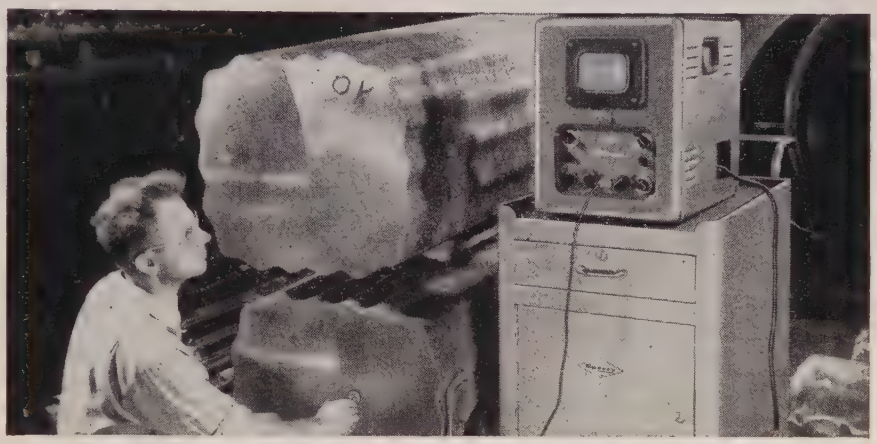
ANY PLANT IS THE RIGHT SIZE

for Sperry Ultrasonic REFLECTOSCOPE TESTING



Sperry Reflectoscope in use at the Ampco Metal, Inc., plant, Milwaukee, Wis.

. . . because this fast, dependable, non-destructive testing is now available through SPERRY INSPECTION SERVICE when you want it at a modest price you can afford. You can hire the services of an experienced Sperry Inspection Engineer using a Sperry Reflectoscope for any desired time from 4 hours up.

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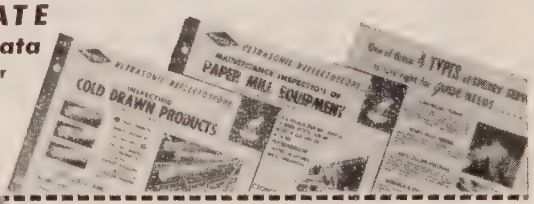

Ultrasonic Sperry Inspection

SPERRY PRODUCTS, INC.
606 SHELTER ROCK ROAD
DANBURY, CONNECTICUT

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MATERIAL TO BE TESTED _____
NAME _____
TITLE _____
COMPANY _____
CO. ADDRESS _____
CITY _____ ZONE _____ STATE _____

mounted in a fixed spindle head of nitralloy steel are stationary and do not revolve. This eliminates possibility of dies revolving the tube with risk of injury to the operator.

Die wear is taken up by means of taper wedges between dies and

hammer blocks. Wedges are readily adjustable from the back of the machine. Amount of die opening is controlled by parallel cotters inserted in side of hammer block and spindle head die slot. Quick change die arrangement on machine front holds die changing time to a minimum. Etna Machine Co., Dept. ST 3430 Maplewood Ave., Toledo 10, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Automatic Loading Platform

. . . matches truck floor and dock

Completely automatic loading platform is actuated from the dock when truck's front wheels touch a switch bar on the floor to set in motion hydraulic lifting mechanism. For handling loads between

truck floor and loading dock, a leveling ramp automatically stops the Load-O-Matic when platform reaches truck floor level.

Trip back to the loading dock is started when truck touches switch bar from the opposite direction. Platform stops as level reaches that of loading dock. Field Engineering Co., Dept. ST, 66 Foote Ave., Jamestown, N. Y.

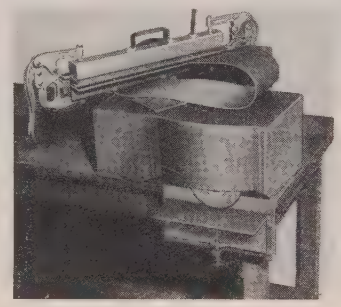
FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Abrasive Belt Splicer

. . . achieves faster splicing

Increased speed is one result of improvements in this Econaway abrasive belt splicer. Redesign includes mounting cutter and press bars on top of the enclosure so operator can perform various steps in splicing any grit paper or cloth backed abrasive belts without moving from one station to another. An electrical curing press is added to reduce curing time from 24 hours to less than 60 seconds.

An enclosure is provided for motor, belt drive and arbor that carries the grinding wheel. Belts can



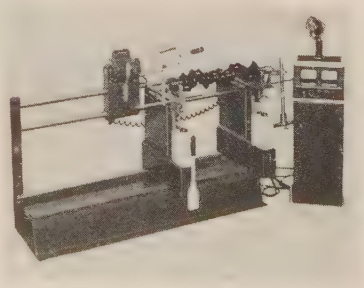
be spliced while a sanding machine waits because of quick splice completion and immediate belt service. Aget-Detroit Co., Dept. ST, 139 Main St., Ann Arbor, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Industrial Balancer

. . . maintenance or production

Setup time is usually held to less than 2 minutes, making this industrial balancer applicable for fast maintenance jobs as well as production work. High-speed milling heads, cutters, and grinding wheels



can be precision-balanced to eliminate marks due to vibration.

Precision sensitivity is possib at all weights of items check or balanced from ½-pound to 10 pounds. Balancing can be done different sensitivity from comple damping to 0.04 ounce-inch. Se up to various lengths is accom plished by a walking mechanis operated by handle on movab stanchion. The balancer is a pro uct of Stewart Warner Corp. a Merrill Engineering Laboratorie and is marketed by the latter 1240 Lincoln, Denver, Colo.

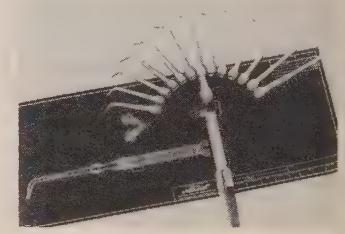
FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Light-Gage Welding Torch

. . . adapted to nonferrous use

This welding torch is develope specifically for light-gage work o nonferrous metals. The torch i corporates needle valves that ar easily adjustable while weldin They keep cool and do not caus flame distortion because of impro er seating or inadequate valve ste support. Welding nozzles have a curately graduated orifice diam ters to achieve a full range of nee ed flame sizes.

Nozzle permits rotation into an desired direction while welding. multi-mixer takes care of all flam



requirements without popping o blowing. National Welding Equip ment Co., Dept. ST, 218 Fremon St., San Francisco 5, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Hydraulic Hose Coupling Shop

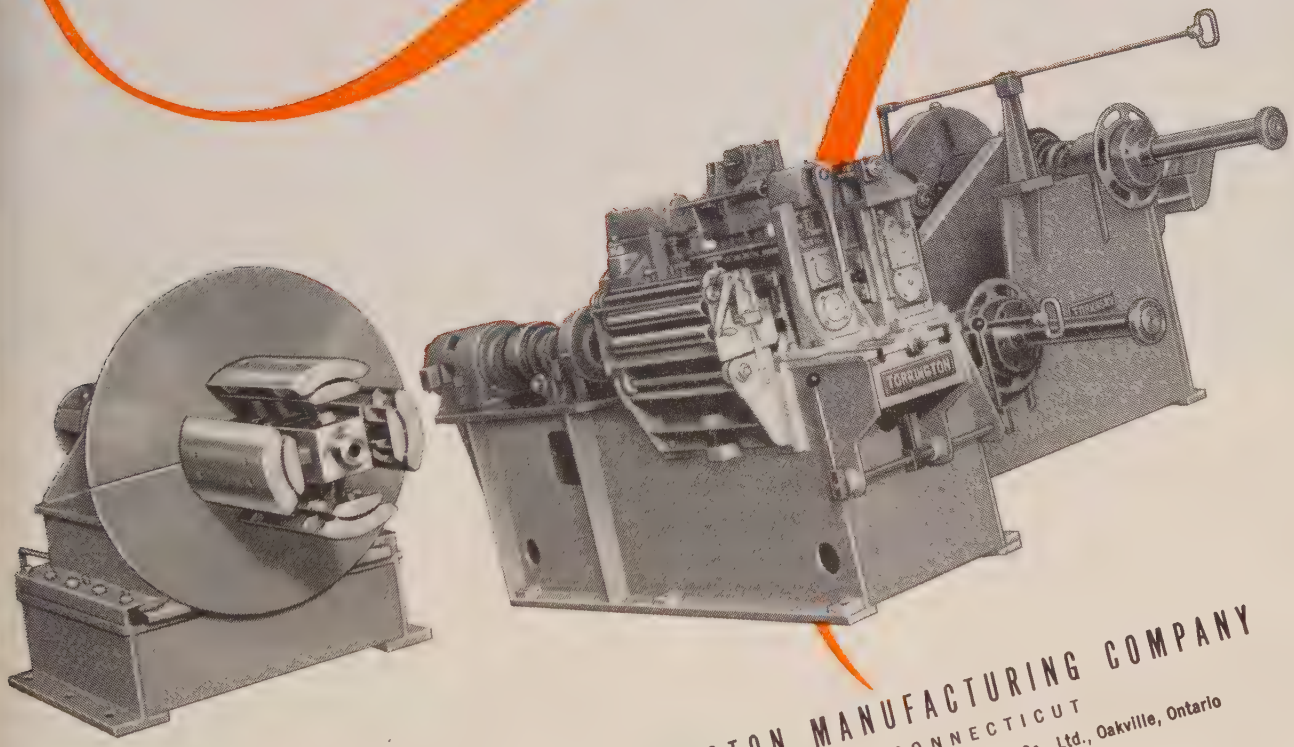
. . . cuts to size, couples

The hydraulic hose coupling sho is a complete, self-contained uni that includes cutoff, skinning an hydraulic press sections. It wi make up single or double braide hose from ¼ to 1¼ inches. Tota assembly time averages about minutes for any length of hos Champ Industries, Dept. ST, P. O Box 6781, Philadelphia, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

TORRINGTON'S NEW MEDIUM-DUTY SLITTING LINE

- Fanning of strips eliminated with two flanged type winding arbors
- Versatility in core size possible with quick-change bolted arbor construction
- Smoother cuts with pull-through operation
- Uniform tension, better cuts with adjustable power-operated expanding arbor payoff
- Easy, rapid setup with hinged entry guide and sliding outer slitting housing
- Anti-friction bearings throughout



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DESIGNERS AND BUILDERS OF MILL MACHINERY FOR OVER SIXTY-FIVE YEARS

Many producers of competitive materials use the corrosion testing facilities operated by International Nickel Co. at Kure Beach on a co-operative basis and have united in exchange of information. This test rack is about 800 feet from shore

In Corrosion Testing ...GET THE FACTS

By DR. ALLEN G. GRAY
Technical Editor

Marine environments are among the most corrosive encountered. Co-operative testing is done by producers and users of metals and coatings at Inco's beach facilities

WHY DO some metals corrode more than others? A French scientist, de La Rive, asked himself this question in 1830. At the time he was interested in the best quality of zinc for constructing a pile which in his day meant something quite different from the pile of today which is tied up with atomic energy talk.

You see, in 1830 the only source of low voltage electric energy was a galvanic battery made of metals like copper or zinc piled up one on the other; hence, the name. De La Rive noticed that various kinds of zinc behaved differently in the solutions used in generation of electricity by this crude method.

Why Was This?—To get the answer he melted zinc with filings of tin, lead, copper and iron and cast small cylinders to use in measuring corrosion rates. This early corrosion experiment was the first to establish that impurities in zinc were the cause of varying corrosion rates in acid.

Since then, corrosion has been recognized as a serious economic problem confronting all industries. New control measures are constantly being tested. Most recent evidence of steps being taken to fight corrosion losses is the conference on heat and corrosion resistant alloys sponsored by International Nickel Co., May 12-14. Some 80 metal experts from 13 states and Canada were represented at the three-day conference held at Inco's Harbor Island testing station, Wrightsville Beach, N. C.

Facts Needed—Loose thinking and loose statements are dangerous when corrosion and material protection are involved. Corrosion engineers and metallurgists all agree: Get the facts in each case and be prepared for the unexpected. A distinguishing feature of the tests going on at Kure Beach and Harbo- Island is the manner in which pro- ducers of competitive product- have united in the fight on thei- common enemy—corrosion.

Marine corrosion, like othe- kinds, is an electrochemical phe- nomenon, the basic principles o- which have been established b- study and research in plants an- laboratories all over the country- However, the most reliable guid- to the proper selection of material- for particular purposes is based o- studies carried out under the ac- tual conditions met in service.

This is the basic reason for In- ternational Nickel's Kure Beach- program—a project that include- the big marine testing station a- Harbor Island near Wrightsville- Beach, N. C., and the sea spray- and atmospheric studies at Kur- Beach. All branches of industry- and educational and research cir- cles are participating in the activ- ities and the problems involved.

Chromium Good—In opening the technical sessions of the meeting Inco's Frank LaQue, reviewed re- sults of alloy tested in salt water- One point brought out was that

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per cent chromium steel is optimum for sea water corrosion; pit depth averages about 0.008 IPY in such steel. Higher chromium content cuts down on overall weight loss but increases depth of pits. Molybdenum is the most potent element for reducing weight loss and depth of pitting in nickel-chromium steels.

Mr. LaQue also emphasized this fact: There is no evidence that the corrosion behavior of stainless steel is changed by modification of surface finish, whether pickled, ground or a mirror finish.

Deleterious—On the other hand, nitriding stainless steel such as type 302 destroys passive characteristics and causes it to corrode in sea water similar to carbon steel. Atmospheric corrosion rate of nitrided stainless steel is also higher than unnitrided. Keep in mind that corrosion information on unnitrided stainless cannot be applied to the same steel in the nitrided condition.

Mr. LaQue pointed out that Hastelloy C, titanium and the Stellites have given the best performance in sea water—corrosionwise.

Alloy Results—Results of tests showing the separate effects of copper, nickel and chromium on the behavior of steels and irons in a marine atmosphere 800 feet from the ocean at Kure Beach, N. C., are shown in Fig. 1. All specimens used in these investigations measured 4 x 6 inches and were exposed in the standard way at an angle of 30 degrees from the horizontal facing south. All specimens were pickled to remove mill scale prior to exposure. Loss in weight during exposure was used to measure corrosion.

There can be as much as a tenfold difference in corrosion between irons carrying 0.005 per cent and 0.05 per cent copper. Data plotted in Fig. 2 show that most of the effect due to the presence of copper is achieved with about the first 0.05 per cent. This holds for both marine and industrial atmosphere exposure.

Look At Standard—The great effect of copper on corrosion in concentrations ordinarily considered as residual serves to make carbon steel of undefined copper content an unsatisfactory basis of comparison in describing the atmospheric corrosion resistance of other steels. A much more satisfactory standard is the ordinary copper steel that contains about 0.20 per cent copper.

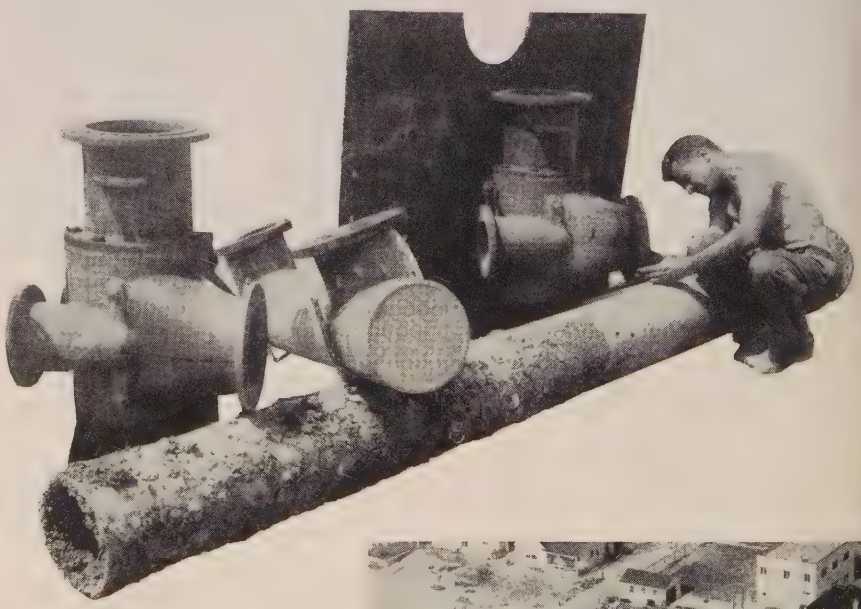
The weight loss-versus-time curves for corrosion of 1 per cent copper, 5 per cent nickel and 5 per cent chromium, plotted in Fig. 1, also include a line representative of the performance, corrosionwise, of proprietary low-alloy high-strength steels manufactured by several producers.

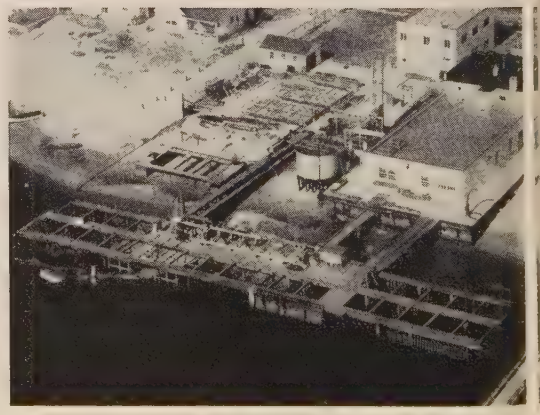
Watch This—Mr. LaQue stated that studies on cathodic protection of iron with zinc have shown that iron content of the zinc is critical for optimum performance. Specification should read 0.0015 per cent iron maximum in the zinc.

Cast vs Wrought—Advantages or disadvantages of cast vs wrought alloys were discussed by Ray Wilcox, Michigan Steel Co., and B. F. Shepherd, Ingersoll-Rand Co. Cast and wrought corrosion resistant alloys of the same nominal composition are designed to perform essentially the same functions so far as resisting corrosion to specific media. There are, however, distinguishing differences in chemical composition, principally in the elements manganese and silicon, in certain metallographic aspects and in certain physical properties.

Alloys, aside from being chemically balanced for corrosion resistance purposes, must also be suitably balanced in composition for satisfactory hot working into rolled forms or casting into cast forms as the case may be. A wider latitude in composition is usually available for casting purposes than in the case of rolled products since the problems of satisfactory hot working characteristics essential to producing rolled products are not usually a factor in casting production. Thus, there are certain alloys available as cast products that are not available in rolled forms, notably items like seamless tubing in alloys such as 29 Cr-9Ni and certain sizes of 25-20 and 25-12, alloys being readily produced as centrifugally cast tubing.

Compositions Compared—In the straight chromium alloys, the upper chromium limits are slightly higher in the cast grades as compared to the corresponding wrought grades, while nickel is slightly higher in the cast group for the





Corrosive effects of sea water are studied at the Harbor Island Marine Laboratory. Everything is under test, even the roof and a chain link fence around the lab which consists of sections of galvanized and stainless steel and aluminum. Above are typical parts that have been tested while they were in use

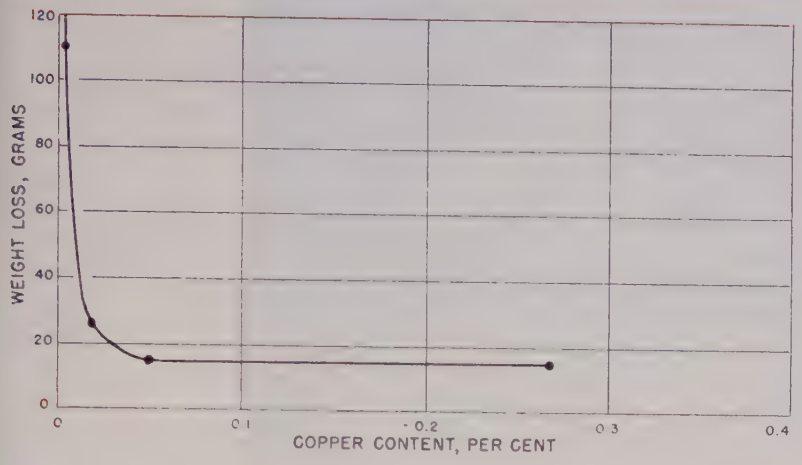


Fig. 1—Curves showing corrosion weight loss versus time for steels exposed at test site

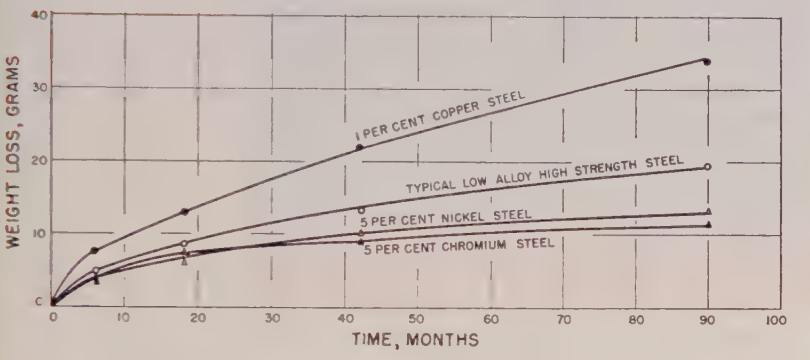


Fig. 2—Effect of copper content on corrosion of open-hearth iron after the 18-month test

purpose of providing a degree of grain refinement and improved ductility. Carbon and manganese limits are essentially the same in both the cast and wrought alloys. However, silicon is generally higher in the cast compositions. This is necessary to give a degree of fluidity to the liquid metal for satisfactory casting.

In the chromium-nickel group, the upper chromium limit is again, in general, higher in the cast grades than in the corresponding wrought grades and particularly in the 18-8 molybdenum alloy. This alloy also has a higher nickel range in the wrought material than in the cast grades.

Key Difference—Of significant difference in the cast and wrought alloys in the chromium-nickel group is the position of manganese and silicon. The wrought alloys carry higher manganese and lower silicon than the corresponding cast alloys. The reasons for these differences in composition is evident in considering the processing requirements of both types of materials.

In the wrought grades where rolling characteristics require that the alloy be as completely austenitic as possible, silicon, which is a ferrite former, is kept low and manganese, which is an austenitic former, is kept high. In the cast grades, silicon, which is a fluidity promoter, is kept high while manganese plays very little role in castability and is maintained in the nominal range.

About The Same—There appears to be little distinction between corrosion resistance of cast and wrought alloys, according to Mr. Wilcox, taking into consideration the differences in silicon content. The higher silicon content of the cast alloys is favorable under certain conditions such as resistance to sulphuric and phosphoric acids and to certain organic acids. On the other hand, the lower silicon content of the wrought alloys is favorable to resistance to nitric acid. This is taken into consideration in certain specifications requirements where the boiling 65 per cent nitric acid test is used for acceptance purposes wherein slightly higher corrosion rates are permitted for casting compared to wrought alloys.

Thus, differences in composition are essentially those required principally for manufacturing purposes. When consumers order these various grades of alloys they should make the appropriate cast or wrought designation.

Intergranular — Methods for avoiding intergranular corrosion of chromium-nickel alloys were discussed by John Juppenlatz, Lebanon Steel Foundry. Susceptibility to intergranular corrosion can be eliminated by heat treatment followed by rapid cooling. This treatment redissolves precipitated carbides so carbon is in solid solution and chromium is supposedly redistributed uniformly throughout the steel. The following schedule of heat treatment conditions was recommended for 19 chromium-9 nickel type alloys based on carbon level:

Carbon Content	Min. Solution Temperature
0.03%	1625°F
0.05	1700°F
0.08	1775°F
0.12	1875°F
0.15	1975°F
0.20	2150°F

Other methods of avoiding intergranular corrosion: Carbide stabilization with additives and use of very low carbon compositions.

Silicon Helps—At the session on high temperature corrosion, Dr. Harry Jackson, Battelle Memorial Institute, reported that 1 to 2 per cent silicon additions are very effective in increasing the corrosion resistance of nickel-chromium alloys in flue gas atmospheres containing sulphur. Effect is that of decreasing the total depth of metal that is converted to scale.

Dr. E. N. Skinner reported that International Nickel Co. has initiated a fundamental program to study high temperature properties of alloys, with the object of preventing loss of scale from the surface. Scaling resistance is determined at 1800°F, using a 15-min-

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INDUCTION HEATING AND MELTING

te heating cycle and a 5-minute ooling cycle. Typical results that ave been obtained are listed in ie table below:

Alloy	Per Cent Weight Change After 3000 Cycles
80Cr-20Ni	-- 1.37
Nimonic 75	+ 0.43
Inconel	+ .029
Inconel X	—20.07
60Cr-15Ni	— 0.55
Incoloy	— 1.22
Type 330	—15.5
Type 310	—23.6
Type 309	—35.9
Type 347	—70.0

Piggy-Back Transport

Freight transport suggestion would team flatcars with highway trailers to ease jam

POSSIBLE solution to the nation's crippling highway traffic glut was offered at the 5th National Materials Handling Exposition by William A. Bauer, board chairman, Baker-Raulang Co., Cleveland. He described a unique "piggy back" system of freight transport which he says could substantially lower the number of over-the-road shipments and allow more room for passenger car travel.

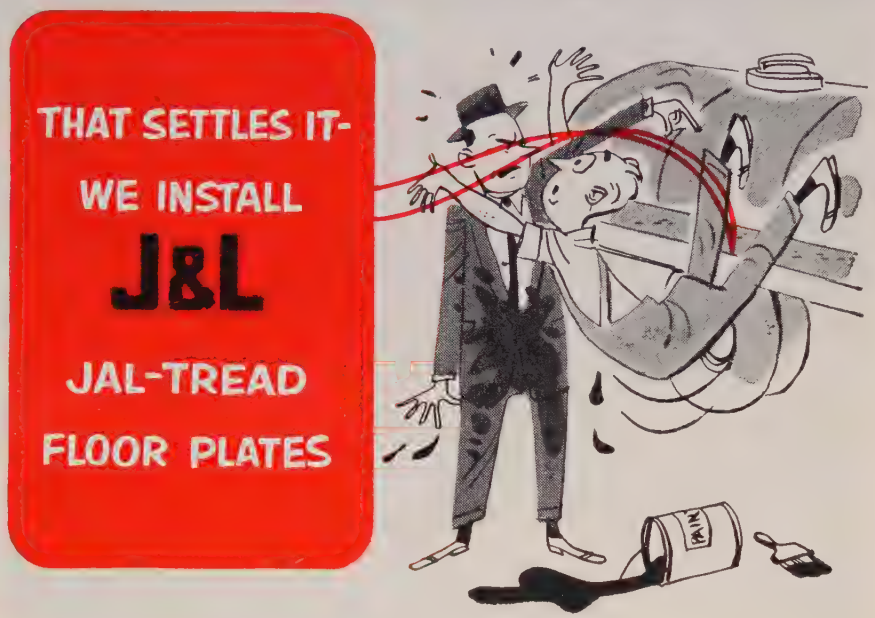
"The piggy back idea", he says, "teams up railroad flat cars with highway trailers for intercity freight hauls. Instead of being driven over already jammed roadways, loaded trailers are put on flat cars and moved by rail—where they do not compete with commuter and tourist traffic." Baker-Raulang is designing and testing equipment to pick up truck trailers and place them on cars.

Found Sound—Radical shipping method has been tested and found workable, he claims. "As a matter of fact, the New York, New Haven & Hartford moves more than 500 semitrailers each week on piggy-back, and the system is now used to a limited extent to bring milk into New York city. Two other major railroads—Chicago Great Western and the Denver & Rio Grande—are making piggy-back runs. Rail carriers say the system has been profitable both for themselves and for highway shippers who have participated."

Mr. Bauer points out that about 400 semi-trailers leave Pittsburgh daily for New York and other large freight traffic centers. Similar numbers rolling out of important terminal cities have added to the locust-swarm of vehicles on our highways, he continues, until today "pleasure driving" is a soured joke to big-city car owners who have learned the hard way about taking a spin in the country.

Deterrent — One shipper estimates his overland hauls would be cut by at least 30 per cent, with the piggy-back method. A shortage of flat cars has been the main deterrent to his participation in the system. Piggy-backing is attractive to many shippers because it would combine the flexibility of truck operations in terminal areas with the speed and economy of long-haul transportation by rail.

"Interest in this new technique is growing," he declares. "One railroad even is considering the possibilities of mounting regular highway trailers so they can be assembled into trains and moved on rails—using their own wheels."



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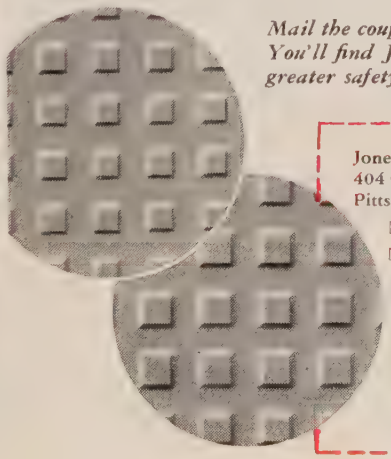
- Easy cold-forming on standard equipment.



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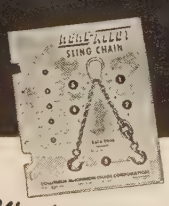

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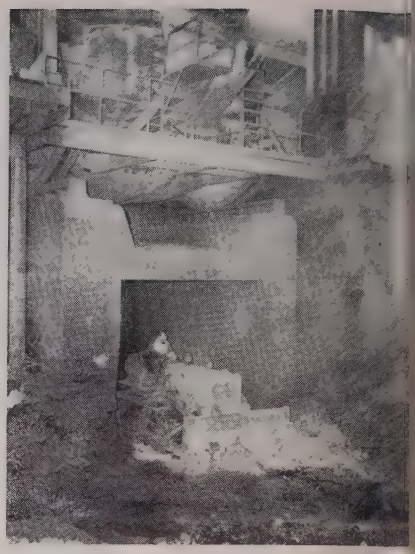

Cats in Steelmaking

Atlantic Steel Co. uses a Caterpillar D6 tractor with hydraulic bulldozer to remove slag from previous pours around the furnace at their Atlanta, Ga., plant. The D6 moves slag from five 68-ton heats every 24 hours. Tractor goes under the furnace by way of a tunnel and dozes slag about 25 feet so it can be removed by a cran

Plastics Move into Filter

TOUGH, corrosion resistant, rigid vinyl plastic is being used to replace expensive metal alloys in many essential parts of an industrial leaf-type filter used for filtering acids, according to the Hercules Filter Corp., Paterson, N.

Filter leaf frames, nuts and bolts holding the leaves together, rollers which hold the leaves in place, the heel plate, and various pipe fittings are made from a rigid Geon vinyl plastic developed by B. F. Goodrich Chemical Co. The inside of the tank is also lined with a flexible vinyl sheeting to protect from corrosion.

Horizontal Tank—Filter is a horizontal cylindrical tank with the filter leaves suspended vertically inside. Each leaf unit consists of a rigid vinyl plastic frame which holds a heavy mesh screen sandwiched between two finer mesh screens.

Besides serving as a support to the very flexible fine-mesh screen, the heavy-mesh screen acts as a spacer for draining the liquid into discharge channels formed by placing several leaf units together. Leaf units are of uniform size and are interchangeable. Any number can be used together, the max

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Move to Mechanical

Mechanical handling system engineered by Gifford-Wood Co., Hudson, N. Y., is simplifying flask handling at Waterbury Mfg. Co. Molds are moved on two roller conveyors to both molding and shakeout stations. A belt conveyor takes sand and sand bin for re-use. Finally, an overhead monorail setup carries gates to the cleaning room

mum depending on the filter area desired and the model of the filter tank itself.

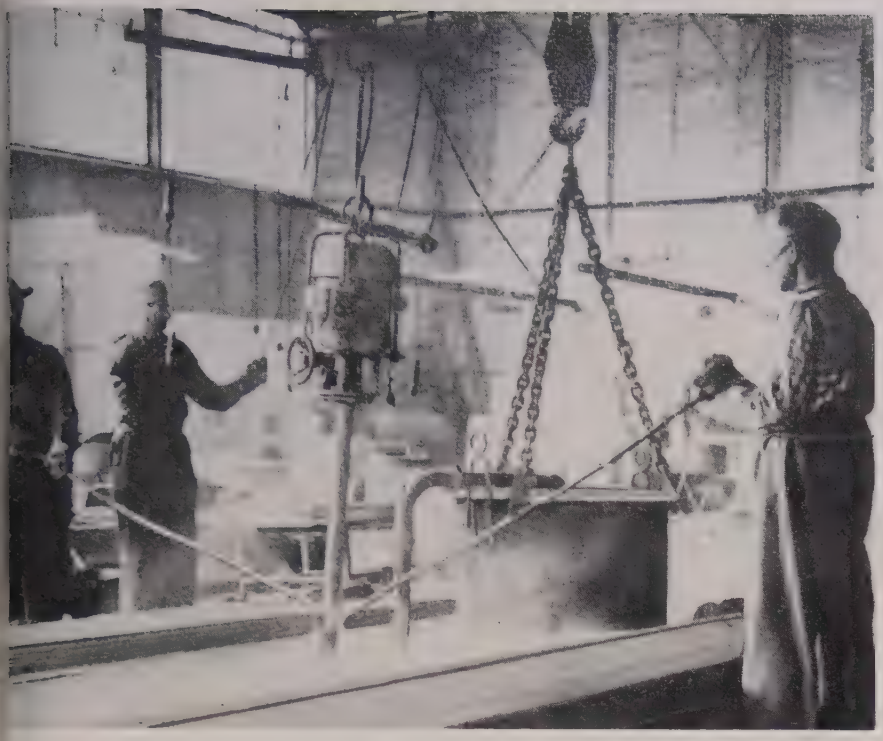
How to Hush A Transformer

Under construction at Pittsfield, Mass., is a million-dollar tool for making quieter power transformers at a lower cost, according to officials of General Electric's Power Transformer Department.

This new facility, a sound test building and special equipment, will be used to noise-test transformers. Test results are expected to point the way to reducing vibrations in even the largest units.

Sound chamber of the test building will be "the quietest room in the world for its size." The chamber will be 56-feet wide, 65 feet long and 49-feet high. It will be large enough to test any transformer being built today and any anticipated within a decade.

Four and a half foot thick double walls will make the chamber completely soundproof. The walls will be composed of concrete, fiberglass masonry, a layer of copper shielding, a 6-inch compartment of air space and, on the inside, 28-inch wedges of fiberglass.



THREE-MAN PUMP WITH DETACHABLE AGITATOR
. . . transformed to spelter pump in a matter of minutes

Versatile Dross Pump-Separator Gets U.S. Showing

IMPROVED pumping operation is indicated for galvanizers by initial results gained with an electrically-driven centrifugal dross pump and separator. The unit premixes dross with zinc through an agitator. Pump and separator had its first U. S. demonstration at the American Hot Dip Galvanizers convention this spring in an installation at Armco Steel Corp., Middletown, O.

Designer and builder of the unit is J.C.J. Galvanizing Works, Copenhagen, Denmark. Design is completed with provision that with slight change dross pump can also be used as a spelter.

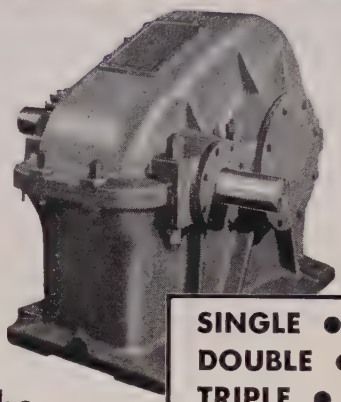
Operation—Premixed dross and zinc is pumped into a special filtration pot that allows free zinc to drain, but retains dross. Pump has variable capacity to allow pumping and filtration to follow the same pace during operation, in which the pump is moved slowly from side to side the length of the kettle. Filtration pot takes 2600 to 3300 pounds of dross, requires 10 to 40 minutes' pumping time per pot depending on dross consistency. Three men operate the pump. In a matter of minutes, by detaching the agitator, it can be used as a spelter pump with about 60 tons per hour capacity.

Filtration pot with the dross, containing about 2½ to 4 per cent iron, is placed in the separator—a special gas-heated oven that frees zinc from dross at an average 20 per cent recovery of zinc with 0.05 to 0.1 per cent iron. Treated dross containing 4½ to 5 per cent iron is cast into ingots by a small stamping plant furnished with separator. This operation requires three men. A one-man-operated separator requires about 1750 cu ft of gas at 450 Btu per ton of dross. It takes approximately 5 hours to complete the entire process.

Advantages—In addition to its versatility, the setup shows other positive features. Drossing can be done during periods of normal downtime, such as a lunch hour. Where a kettle cannot be completed in one day, the job can be continued on successive days during similar periods. The pump is especially valuable where it is hard to dross by spoon. Its effect is reported clean and thorough, plus making possible reclamation of free zinc in a prime condition.

Continuous Tooth

HERRINGBONE GEAR SPEED REDUCER



SINGLE •
DOUBLE •
TRIPLE •
REDUCTION

The GEAR with the Backbone •

Some Proven On-the-Job Advantages of This Type of Gear Reduction Are:

1. No side thrusts, avoidable deflections, distortions, impact stresses.
2. Stronger teeth, due to archlike construction.
3. Greater load carrying capacity.
4. More silent and smoother gear action.
5. Uniform load across face due to balanced thrusts of opposing helices.
6. Better lubrication, due to wedge action of teeth.
7. Overall design makes it less costly to produce.
8. Can be substituted for straight tooth gears.

We have extensive facilities for making Herringbone Gears, producing them from 1" to 60" in diameter, 16 DP to 1½ DP and up to a 20" face.

YOUR GEAR INQUIRIES WILL RECEIVE PROMPT ATTENTION FROM US.

SEND FOR CATALOG 40-C

ESTABLISHED 1888

D. O. James

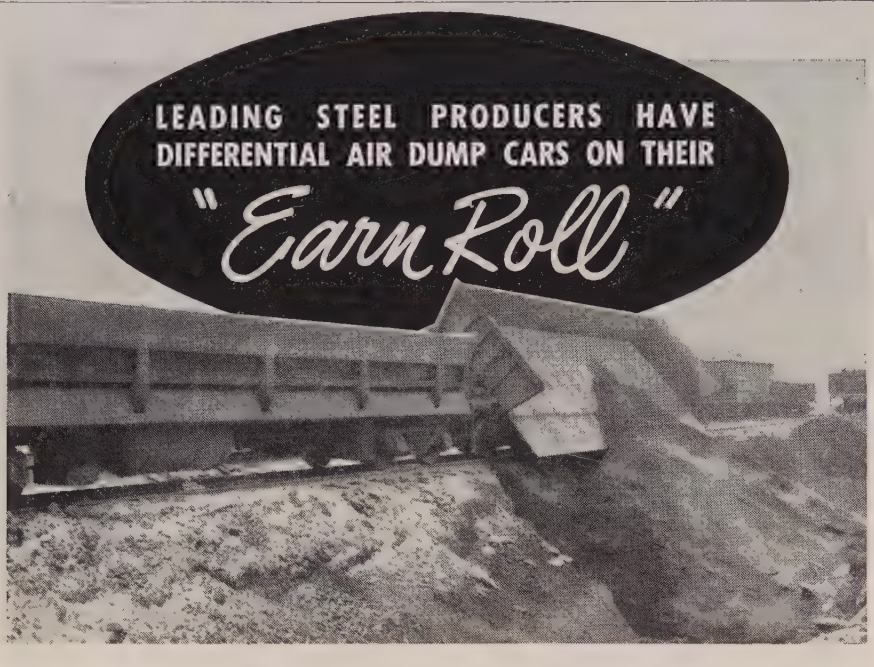
D. O. JAMES GEAR MANUFACTURING CO.
1140 W. Monroe Street, Chicago 7, Ill.

Tube Welding Mill Is Compact

A highly compact electric weld tube mill, designed and built by the Herr Engineering Co., Warren, O., produces a wide variety of sizes and types of tubing. The mill forms flat stock, welds the joint, burrs the seam, and sizes the tube in one continuous operation. It has ten roll passes, six in the forming section and four in sizing section.

Compactness is a feature of the new mill. A short center distance (11¼ inches) between roll stands greatly reduces the overall length of the mill. This is made possible through use of Cone-Drive double enveloping gearing—which permits the carrying of higher loads on smaller center distances—in the ten speed reducers used in the drive system.

The small 2-inch center distance of the reducers nearly equals that of the rolls, permitting the universal joint assemblies to be almost parallel to each other. This provides a smooth drive and also reduces overall height of the rollers.



THE "WHAT" Nearly forty steel mills, here and abroad, have purchased Differential Air Dump cars in capacities ranging from 30 to 60 cubic yards (level load).

THE "HOW" Massive air cylinders on both sides power the two-way, 50° dumping action. Wide spacing of fulcrums contributes to riding stability. No locking mechanism — no accidental dumping.

Down-folding doors chute the load a greater distance from track. Positive door return when car is righted. Overall ruggedness and simplicity of design mean minimum maintenance.

THE "WHY" It all adds up to a "higher ratio of payload to dead weight," superior performance — and ultimately to a prettier picture on the operating statement. That's "why" more and more steel mills have put Differential cars on their "earn-roll."

Other Differential Products: **Locomotives, Mine Cars, Mine Supply Cars, Rock Larries, Mantrip Cars, Rotary Dumpers and other dumping devices, and Complete Haulage Systems.**

SINCE 1915—PIONEERS IN HAULAGE EQUIPMENT

Simulated Training

All-electric simulator for the 20[illegible] passenger Globemaster has been com[illegible] pleted by Curtiss-Wright Corp. f[illegible] the Air Force. Used for synthetic cre[illegible] training, the simulator is a complet[illegible] and accurate duplicate C-124A coc[illegible] pit. Major advance: All-electronic co[illegible] trol loadings to meet USAF specs f[illegible] fast response, and complete radio a[illegible]

Mechanical Move for Jets

Production of T-33s, the inte[illegible] national jet trainer, will roll at [illegible] faster clip—and with reduced a[illegible] sembly cost—through installati[illegible] of a mechanized final assembly li[illegible] at Lockheed Aircraft Corp.'s pla[illegible] in Van Nuys, Calif. Work on t[illegible] mechanization project, which w[illegible] cost approximately $60,000, will [illegible] completed about Aug. 1.

Conversion of the present ma[illegible] ual-move system to a nonstop op[illegible] ation will make possible accelerat[illegible] output by the final assembly lin[illegible] Lockheed plant engineers say. It [illegible] estimated that the mechanized li[illegible] will cut final assembly time by a[illegible] proximately 25 hours per airplan[illegible]

Pilots from nine North Atlanti[illegible] Treaty Organization countries ha[illegible] received their jet aircraft trans[illegible] tion instruction in the Lockhe[illegible] trainer. T-33s are being se[illegible] abroad under the Mutual Defen[illegible] Assistance Pact to France, Turke[illegible] Greece, Yugoslavia, Italy, Belgiu[illegible] and Holland.

The new assembly line will [illegible] elliptically shaped, curving dow[illegible] one side of the hangar and ba[illegible] again for an over-all length of 7[illegible] feet, with 22 assembly stations.

OINING 1¼-in. thick phosphorized copper-plate bottom and shell, using ANACONDA Copper-372 Welding Rod and Aircomatic process. Grooves are angled 60° to 90°, root spacing $^{3}/_{16}$ in. Welds made with four passes on one side, back chipping and one pass on other side.

UNUSUAL COPPER WELDING JOB—

1⅛-in. thick plates welded at high speeds

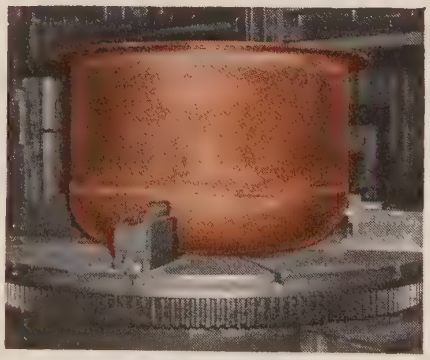
This was an unusual job for any metal fabricating concern. It involved four chemical process kettles formed from 1⅛-in. phosphorized copper plate into shells 6 ft. in diameter by 3 ft. deep and fitted with reversed-dished bottoms 18 in. deep—the bottoms welded to the shells.

The welding process selected by The Ansonia Copper and Iron Works of Cincinnati, fabricators of the kettles, was the Aircomatic® process using ANACONDA Copper-372* Welding Rod in coil. At the start of each weld, the work was preheated to only 300 F. With a welding current of 400-500 amperes, the $^{1}/_{16}$-in. and $^{3}/_{32}$-in. welding rod was fed in at speeds up to 396 inches per minute.

The welding of copper plate of this thickness is exceptional. Conventional methods would have required up to 2½ hours per foot of joint, but with ANACONDA Copper-372 Welding Rod and the Aircomatic process these joints required only 13 minutes per foot.

Whatever type of welding business you are engaged in—fabricating, production or repair—there's a correct ANACONDA Copper or Copper Alloy Welding Rod for nearly every job. They are available from distributors throughout the United States. Publication B-13 tells about them. For your copy, write to *The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.*

*U. S. Patent No. 2,220,464 53159



HERE'S THE FINISHED WELD. ANACONDA Copper-372 Welding Rod was used because welds develop full strength of annealed base metal without costly hammering

braze or weld with confidence— **ANACONDA**® *welding rods*

History in the Making

MEN WITH
A VISION
AND A
PURPOSE

THE CLEVELAND MEN

Under authority of a special act of the Michigan l
legislature, on December 26, 1850 "The Cleveland I
Men" met at the old Canal Bank in Cleveland, Ohio
to form The Cleveland Iron Mining Company. From
this beginning grew The Cleveland-Cliffs Iron
Company. This pioneering undertaking was one of
the initial steps in the founding of the great Lake
Superior iron ore industry.

LAKE SUPERIOR IRON ORE • VESSEL TRANSPORTATION
COAL • FERRO ALLOYS

THE Cleveland-Cliffs IRON COMPANY

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

The Market Outlook

THE step-by-step movement toward balance in steel supply and demand continues.

Evidences of this are the growing caution displayed by purchasers of conversion (high-priced) steel and price cuts by two premium price producers of galvanized sheet steel in the face of generally rising prices of steel.

The conversion steel buyers think they may be able soon to get all of the steel they need without paying premium prices.

PRICES CUT—The price cuts by the two sellers of galvanized sheets follow a decline in demand generally for that product. One of those producers lowered the base price of its galvanized sheets from $109.50 a net ton of 10 gage to $106.50, a $3 reduction. In addition, that producer shaved $3 from its price of galvannealed sheets, reducing them from $120.50 a ton to $117.50. The other producer cut the galvanized sheet price from $115.50 a net ton of 10 gage to $109.50, a $6 drop.

CAUTIOUS— The consumers becoming cautious over conversion steel are principally the automobile manufacturers, largest users of this material. They have been making generous use of premium price tonnage for an extended period to piece out their steel supplies. Their cautiousness not only makes them wary of signing commitments for fourth-quarter delivery but is influencing them to push for the earliest possible delivery of tonnage already ordered for third quarter.

PLAYING SAFE—Purchasing departments are pressing for fast delivery of conversion steel already ordered because they would be in an embarrassing position if shipments of such steel surged in after steel is readily available at regular mill prices. Nevertheless, the conversion steel buyers are still keeping one foot in the doorway so they can get this steel if they need it after the third quarter.

The premium-price areas of the steel market are naturally among the first ones to reflect approach of a balance in steel supply and demand. That business could disappear and still there could be a good demand for steel. Look at the automakers. They are chary over conversion steel but they are not letting up in their demand for the biggest possible tonnage of hot-rolled and cold-rolled steel sheets at regular mill prices.

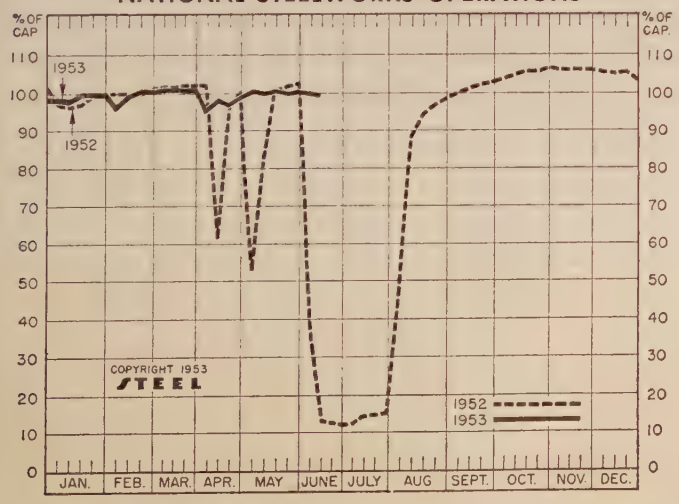
TIGHT SPOTS—Supply of some forms of steel already has overtaken demand. The forms that now are in particularly strong demand are the light flat-rolled products used by the booming automobile industry and large bars used by it and the ammunition program. However, the Korean peace talks have decreased the anxiety of nonmilitary customers as to bar deliveries.

Demand for hot-rolled and cold-rolled sheets has been so heavy that in the East a number of sheet users would have to reduce operations appreciably were it not for importations of sheets from Europe.

HOPEFUL— Even though steel demand may decline somewhat in the U. S., sellers of foreign steel are not dismayed over such a possibility. They think their competitive position will be improved by a rise in base prices by United States producers after a wage increase to the steelworkers.

PRODUCTION PACE—With over-all demand still strong, steel production continues at a high rate, although it has declined half a point in each of the last two weeks. In the week ended June 13, output of steel for ingots and castings was at 99.5 per cent of capacity. This rate yields 2,245,000 net tons.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended June 13	Change	Same 1952	Week 1951
Pittsburgh	98	+ 1.5	2	100.5
Chicago	105.5	0*	7.5	104.5
Mid-Atlantic	98	0	19	101
Youngstown	105	0	0	105
Wheeling	100	— 0.5	51.5	98.5
Cleveland	98.5	— 5.5	0	100.5
Buffalo	106.5	0	0	104
Birmingham	101	0	0.5	100
New England	95	+ 5	25	85
Cincinnati	95	— 4	58.5	104
St. Louis	82.5	— 6.5*	38.5	95
Detroit	110	+ 3	32	108
Western	111	+ 2	33	105.5
Estimated National Rate	99.5	— 0.5	13	103

*Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

The Metalworking Outlook—p. 41 Production-Engineering News—p. 89

Composite Market Averages

FINISHED STEEL PRICE INDEX: Bureau of Labor Statistics	June 9 1953	June 2 1953	Month Ago	May Average
(1947-1949=100)	136.6	136.6	133.7	133.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended June 9, 1953

Units are 100 lb except where otherwise noted. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$4.075	Sheets, C.R. carbon	$5.625
Track spikes	6.875	Sheets, galv.	6.765
Track bolts	10.175	Strip, C.R., carbon	5.100
Tie plates	4.925	Strip, C.R. stainless (lb)	0.333
Joint bars	5.075	Pipe, black, buttweld (100 ft)	7.500
Plates, carbon	4.288	Pipe, galv., buttweld (100 ft)	9.166
Structural shapes	4.400	Boiler tubes (100 ft)	36.168
Bars, tool steel (lb)	1.580	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	7.025	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.153	Wire, carbon, merchant	6.392
Bars, carbon	4.400	Wire, fence, galv.	7.017
Bars, reinforcing	4.250	Nails (100 lb kegs)	7.410
Bars, C.F. carbon	6.275	Wire, barbed (80 rod spool)	6.160
Sheets, H.R., carbon	4.375	Woven wire fence (20 rod roll)	13.629

FINISHED PRICE INDEX, Weighted:

Calculated by STEEL*	June 11 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	182.82	182.82	181.31	171.92	135.02
Index in cents per lb.	4.953	4.953	4.912	4.657	3.658

ARITHMETICAL PRICE COMPOSITES:
Calculated by STEEL*

Finished Steel NT	$111.28	$111.28	$110.98	$106.32	$80.27
No. 2 Fdry. Pig Iron, GT	55.04	55.04	55.04	52.54	40.59
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	40.12
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	41.12
Steelmaking Scrap, GT	39.50	39.50	38.83	43.00	40.67

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	June 11 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.875
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.875
Bars, H.R., del. Philadelphia	4.502	4.502	4.502	4.252	3.356
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.50
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.775
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.775
Shapes, del., Philadelphia	4.13	4.13	4.13	3.93	2.98
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.925
Plates, Chicago	3.90	3.90	3.90	3.70	2.925
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.45
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.65
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60–75	2.775
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.775
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.50
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.50
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.76
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.90
Strip, H.R., Pitts.	3.975-4.225	3.975-4.225	3.975-4.225	3.75-4.00	3.05
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.775
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.65-5.35	3.775
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.60
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.735
Wire, Basic, Pitts.	5.475-5.225	5.475-5.225	5.475-5.225	4.85-5.10	3.725
Nails, Wire, Pittsburgh	6.35	6.35	6.35	5.90-6.20	5.125
Tin plate, box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$6.65
SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$54.00
Wire rods, $\frac{7}{32}$-⅜", Pitts.	4.425	4.425	4.425	4.10–30	3.175
PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$40.00
Basic, Valley	54.50	54.50	54.50	52.00	39.00
Basic, del, Phila.	59.25	59.25	59.25	56.75	42.17
No. 2 Fdry, Pitts.	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, Chicago	55.00	55.00	55.00	52.50	39.00
No. 2 Fdry, Valley	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, del. Phila.	59.75	59.75	59.75	57.25	42.67
No. 2 Fdry, Birm.	51.38	51.38	51.38	48.88	39.38
No. 2 Fdry (Birm.) del. Cin.	58.93	58.93	58.93	55.49	45.09
Malleable, Valley	55.00	55.00	55.00	52.50	39.50
Malleable, Chicago	55.00	55.00	55.00	52.50	39.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	58.00
Ferromanganese, Etna, Pa.	200.00†	200.00†	196.00†	188.00‡	151.00*

*F.o.b. cars, Pittsburgh; 78-82% Mn, per gross ton. †74-76% Mn, per net ton. ‡78-82% Mn, per gross ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$39.50	$39.50	$39.50	$44.00	$40.25
No. 1 Heavy Melt, E. Pa.	41.50	41.50	41.00	42.50	42.50
No. 1 Heavy Melt, Chicago	37.50	37.50	36.00	42.50	39.25
No. 1 Heavy Melt, Valley	41.50	41.50	41.50	44.00	40.25
No. 1 Heavy Melt, Cleve.	39.00	39.00	39.00	43.00	39.75
No. 1 Heavy Melt, Buffalo	40.75	40.75	41.75	43.00	44.00
Rails Rerolling, Chicago	47.50	47.50	47.50	52.50	52.50
No. 1 Cast, Chicago	38.00	38.00	41.50	49.00†	69.00

†F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$13.00
Beehive, Fdry, Connlsvl.	17.00	17.00	17.00	17.50	15.125
Oven Fdry, Chicago	24.50	24.50	24.50	23.00	19.50

PIG IRON

F.o.b furnace prices as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies on pages 186-187.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.	....	60.78	61.28	....
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity,Ala. R2	50.88	51.38	....	....
Birmingham R2	50.88	51.38	....	....
Birmingham S9	....	51.38	....	....
Woodward,Ala. W15	50.88	51.38	....	....
Cincinnati, del.	....	58.93	....	....
Buffalo District				
Buffalo R2	54.50	55.00	55.50	....
Buffalo H1	54.50	55.00	55.50	....
Tonawanda,N.Y. W12	54.50	55.00	55.50	....
No.Tonawanda,N.Y. T9	....	55.00	55.50	....
Boston, del	65.15	65.65	66.15	....
Rochester,N.Y., del.	57.52	58.02	58.52	....
Syracuse,N.Y.,* del.	58.62	59.12	59.62	....
Chicago District				
Chicago I-3	54.50	55.00	55.00	55.50
Gary,Ind. U5	54.50	....	55.00	....
IndianaHarbor,Ind. I-2	54.50	....	55.00	....
So.Chicago,Ill. W14	54.50	55.00	55.00	....
So.Chicago,Ill. Y1	54.50	55.00	55.00	....
So.Chicago,Ill. U5	54.50	....	55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon,Mich., del.	....	61.30	61.30	....
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	....
Akron,O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain,O. N3	54.50	....	....	55.50
Duluth I-3	....	....	55.00	....
Erie,Pa. I-3	54.50	55.00	55.00	55.50
Everett.Mass. E1	....	59.50	60.00	....
Fontana,Calif. K1	60.50	61.00	....	....
GraniteCity,Ill. G4	56.40	56.90	57.40	....
St.Louis, del. (inc. tax)	57.15	57.65	58.15	....
Ironton,Utah C11	54.50	55.00	....	....
Geneva,Utah C11	54.50	55.00	....	....
LoneStar,Texas. L6	50.50	*51.00	51.00	....
Minnequa,Colo. C10	56.50	57.50	57.50	....
Rockwood,Tenn. T3	....	....	58.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	....	55.00	55.00	55.50
Pitts.,N.&S. sides, Ambridge				
Aliquippa, del	....	56.37	56.37	56.87
McKeesRocks, del.	....	56.04	56.04	56.54
Lawrenceville, Homestead,				
Wilmerding, Monaca, del.	....	56.66	56.66	57.16
Verona, Trafford, del.	....	57.19	57.19	57.69
Brackenridge, del.	....	57.45	57.45	57.95
Bessemer,Pa. U5	54.50	....	55.00	55.50
Clairton,Rankin,So.Duquesne, Pa.U5	54.50	....	....	....
McKeesport,Pa. N3	54.50	....	....	55.50
Monessen,Pa. P7	56.50	....	....	....
Sharpsville,Pa. S6	....	....	55.00	55.50
Steelton, Pa. B2	56.50	57.00	57.50	58.00
Swedeland,Pa. A3	58.50	59.00	59.50	60.00
Toledo,O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47	....	....
Troy,N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard,O. Y1	54.50	55.00	55.00	....
Youngstown Y1	54.50	55.00	55.00	....
Youngstown U5	54.50	....	....	55.50
Mansfield,O., del.	59.15	59.65	59.65	60.15

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton
(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson,O. G2, J1	$65.50
Buffalo H1	66.50

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton
(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	92.00
Keokuk,OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.00
Wenatchee,Wash., OH & Fdry., freight allowed K2	92.00

CHARCOAL PIG IRON, Gross Ton
(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$68.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$59.00
Steelton,Pa. B2	62.00
Philadelphia, delivered	66.50
Troy,N.Y. R2	62.50

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NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 29.75-30.00c, Conn, Valley; Lake nom.; foreign electrolytic, del. 29.75-30.00c.

Brass Ingots: 85-5-5-5 (No. 115) 26.00c; 88-10-2 (No. 215) 34.75c; 80-10-10 (No. 305) 31.00c; No. 1 yellow (No. 405) 21.25c.

Zinc: Prime western 11.00c; brass special 11.25c; intermediate 11.50c; East St. Louis; high grade 12.35c, and special high grade 12.50c delivered.

Lead: Common 13.30c; chemical 13.40c; corroding 13.40c; St. Louis.

Primary Aluminum: 99% plus, ingots 20.50c, pigs 19.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb l.l. orders.

Secondary Aluminum: Piston alloys 22.50-23.00; No. 12 foundry alloy (No. 2 grade) 22.25-22.75; steel deoxidizing grades, notch bars, granulated or short: Grade 1, 23.25-24.00; grade 2, 22.25-23.00; grade 3, 21.50-22.25; grade 4, 20.50-21.25.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 27.00c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt RFC, 121.50c; outside market 92.00c.

Antimony: American 99-99.8% and over but not meeting specifications below 34.50c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 35.00c; f.o.b. Laredo, Tex., or bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 60.00c; 25-lb pigs 62.65c; "XX" nickel shot, 63.65c; "F" nickel shot or ingots, for addition to cast iron, 60.00c. Prices include import duty.

Mercury: Open market, spot, New York, $195-198, per 76-lb flask.

Cadmium: "Regular" straight or flat forms, 2 deld.; special or patented shapes $2.15.

Beryllium-Copper: 3.75-4.25% Be. $40.00 per lb of contained beryllium, with balance as copper at market price on date of shipment, f.o.b. Reading, Pa, or Elmore, O.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open-market, New York 85.25c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $165-$175 per troy ounce.

Titanium: (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Cents per pound, f.o.b. mill, effective Apr. 1, 1953. Listings are lowest quotations.)

Sheet: Copper 50.48; yellow brass 42.87; commercial bronze, 95% 49.89; 90% 48.76; red brass, 85% 47.11; 80% 45.99; best quality, 44.43; nickel silver, 18%, 59.84; phosphor-bronze grade A, 5%, 70.50.

Rod: Copper, hot-rolled 46.83; cold-drawn 48.08; yellow brass free cutting, 36.68; commercial bronze 95% 49.58; 90% 48.45; red brass 85%, 46.80; 80%, 45.68.

Seamless Tubing: Copper 50.42; yellow brass 45.78; commercial bronze, 90%, 51.32; red brass, 85%, 49.92.

Wire: Yellow brass 43.16; commercial bronze, 95%, 50.18; 90%, 49.05; red brass, 85%, 47.40; 80%, 46.28; best quality brass, 44.72.

(Base prices effective Apr. 1, 1953)

Copper Wire: Bare, soft, f.o.b. eastern mills, 500,000 lb lots, 37.46; 30,000 lb lots, 37.58; c.l. 38.08. Weatherproof, 100,000 lb, 37.85; 30,000 lb, 38.10; l.c.l., 38.60. Magnet wire del., 15,000 lb or more 43.93; l.c.l., 44.68.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Jan. 22, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	32.9	...	...
0.135-0.096	12-48	33.4	...	...
0.095-0.077	12-48	34.1	31.8	36.3
0.076-0.061	12-48	34.7	32.0	36.5
0.060-0.048	12-48	35.0	32.2	36.8
0.047-0.038	12-48	35.5	32.6	37.1
0.037-0.030	12-48	35.9	33.0	37.8
0.029-0.024	12-48	36.5	33.3	38.3
0.023-0.019	12-36	37.1	34.0	39.0
0.018-0.017	12-36	37.9	34.6	39.9
0.016-0.015	12-36	38.8	35.4	41.1
0.014	12-24	39.8	36.4	42.4
0.013-0.012	12-24	40.9	37.1	43.4
0.011	12-24	41.9	38.3	45.0
0.010-0.0095	12-24	43.1	39.4	46.6
0.009-0.0085	12-24	44.3	40.7	48.5
0.008-0.0075	12-24	45.8	41.9	50.3
0.007	12-18	47.3	43.4	52.6
0.006	12-18	48.9	44.8	57.6

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— 17S-T4	Hexagonal 17S-T4
0.125	56.8	...
0.156-0.188	48.0	...
0.219-0.313	45.3	...
0.375	43.7	52.4
0.406	43.7	...
0.438	43.7	52.4
0.469	43.7	...
0.500	43.7	52.4
0.531	43.7	...
0.563	43.7	49.2
0.594	43.7	...
0.625	43.7	49.2
0.688	43.7	49.2
0.750-1.000	42.6	46.4
1.063	42.6	44.8
1.125-1.500	41.0	44.8
1.563	40.5	...
1.625	39.8	43.2
1.688-2.000	39.8	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $18.25 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $18.25 per cwt. Traps and bends: List prices plus 30%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.75-21.75c; over 12-in. 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill effective Mar. 9, 1953) Sheets, cold-rolled 86.50c. Strip, cold-rolled 92.50c. Rods and shapes, 82.50c. Plates, 84.50c. Seamless tubes 115.50c.

MONEL

(Base prices f.o.b. mill effective Mar. 9, 1953) Sheets, cold-rolled 67.50c. Strip, cold-rolled 70.50c. Rods and shapes, 65.50c. Plates 66.50c. Seamless tubes, 100.50c. Shot and blocks, 57.00c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb 58.00c-65.00c; 25 to 99 lb, 48.00c-55.00c; 100 lb to 5000 lb, 44.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chormic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 42.18c; oval 41.68c.

Nickel Anodes: Rolled, oval, carbonized, carloads 81.00c; 5000 to 29,999 lb, 83.00c; 500 to 4999 lb, 85.00c; 1 to 499 lb, 89.00c, f.o.b. Cleveland.

Nickel Chloride: In 100 lb bags; 10,000 lb and over, 37.00c; 5000 to 9900 lb, 38.00c; 400 to 4900 lb, 40.00c; 300 lb, 42.00c; 200 lb, 43.00c; 100 lb, 45.00c, f.o.b. Cleveland.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers $1.10 per lb; 100 to 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers. Based on $1.215 tin.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac. Based on $1.215 tin.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers. Based on $1.215 tin.

Stannous Chloride (Anhydrous): In 400 lb bbl, $1.25; 100 lb kegs $1.26, f.o.b. Carteret, N. J., freight allowed on 100 lb or more. Based on $1.215 tin.

Scrap Metals

Brass Mill Allowances

(Prices in cents per pound for less than 20,000 pounds, f.o.b. shipping point; on lots over 20,000 pounds at one time of any or all kinds of scrap, add 1 cent per pound.)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	28.625	28.625	27.875
Yellow Brass	21.375	21.125	19.625
Commercial Bronze			
95%	27.250	27.000	26.500
90%	26.125	25.875	25.375
Red Brass			
85%	25.125	24.875	24.375
80%	24.125	23.875	23.375
Best Quality(71-80%)	22.500	22.250	21.750
Muntz metal	20.000	19.750	19.250
Nickel silver, 10%	25.250	25.000	12.625
Phos. Bronze, A	30.625	30.375	29.375
Naval Brass	20.000	19.750	19.250
Manganese Bronze	20.000	19.750	19.250

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 24.00; No. 2 copper 22.50; light copper 21.00; refinery brass (60% copper) per dry copper content 20.00.

INGOT MAKERS' COPPER AND BRASS SCRAP BUYING PRICES

(Cents per pound, carlots, delivered)

No. 1 copper 24.00; No. 2 copper, 22.50; light copper 21.00; No. 1 composition solids, 18.00-18.50; radiators 14.00-14.50; heavy yellow brass solids, 14.00-14.50; yellow brass turnings 13.50.

SMELTERS' BUYING PRICES FOR SCRAP ALUMINUM

(Carlots, delivered)

2S aluminum clippings, 16.50-17.00c; mixed clippings, 15.50-16.00c; old aluminum sheet, 13.00-13.50c; old aluminum cast, 12.75-13.50c; borings and turnings, 14.00-14.50c.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 23.00-23.50; No. 2 20.50-21.00; light copper 18.50-19.00; No. 1 composition red brass 17.00; No. 1 composition turnings 16.50; mixed brass turnings 10.00; new brass clippings 17.50; No. 1 brass rod turnings 16.00; light brass 10.00; heavy yellow brass 12.50; new brass rod ends 16.50; auto radiators, unsweated 13.00; cocks and faucets 15.00; brass pipe 16.00.

Aluminum: Clippings 2S 13.00; old sheets 9.00; crankcase 9.00; borings and turnings 6.50; pistons and struts 6.50.

Tin: No. 1 pewter 55.00; block tin pipe 80.00; No. 1 babbitt 45.00.

Lead: Heavy 10.25-10.75; battery plate 5.75-6.00; linotype and stereotype 12.50-13.25; electrotype 10.75-11.50; mixed babbitt 11.50-12.50.

Zinc: Old zinc, 4.50; new die cast scrap, 4.50; old die cast scrap, 3.50.

Nickel: Sheets and clips $1.00; rolled anodes $1.00; turnings 85.00; rod ends $1.00.

Monel: Clippings 33.00; old sheet 30.00; turnings 25.00; rods 33.00.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
June 11	29.75-30.00	13.30	11.00	92.00	20.50	34.50	60.00	85.25
June 10	29.75-30.00	13.05	11.00	92.00	20.50	34.50	60.00	85.25
June 9	29.75-30.00	13.05	11.00	91.75	20.50	34.50	60.00	85.25
June 8	29.75-30.00	13.05	11.00	92.75	20.50	34.50	60.00	85.25
June 5-6	29.75-30.00	13.05	11.00	93.50	20.50	34.50	60.00	85.25
June 4	29.75-30.00	13.05	11.00	95.50	20.50	34.50	60.00	85.25
June 3	29.75-30.00	13.05	11.00	95.75	20.50	34.50	60.00	85.25
June 1-2	29.75-30.00	13.05	11.00	95.00	20.50	34.50	60.00	85.25
May 29	29.75-30.00	13.05	11.00	95.50	20.50	34.50	60.00	85.25
May 26-28	29.75-30.00	13.05	11.00	96.00	20.50	34.50	60.00	85.25
May 25	29.75-30.00	12.80	11.00	97.25	20.50	34.50	60.00	85.25
May 22-23	29.75-30.00	12.80	11.00	95.75	20.50	34.50	60.00	85.25
May 21	29.75-30.00	12.80	11.00	97.50	20.50	34.50	60.00	85.25
May 20	29.75-30.00	12.80	11.00	98.50	20.50	34.50	60.00	85.25
May Avg.	29.845	12.55	11.00	97.240	20.50	34.50	60.00	85.25
Apr. Avg.	30.755	12.473	11.00	102.567	20.50	34.50	60.00	85.25

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9% base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

The Metal Market

Peace in Korea will have only minor effects on nonferrous metal markets. Ratio of civilian to defense usage of metals has been growing. Transition period won't be needed

END of the shooting in Korea will have only minor effects on metal markets.

Few parallels can be drawn between the present situation and occurrences after V-J Day, eight years ago. Defense production will continue with no major shifts and only slight realignments. There will be no across-the-board contract cancellations.

Ready and Waiting—Industry today is prepared for the armistice. After months of the off-again on-again negotiations, everyone has post-emergency plans drawn. Most have already been dusted off and are ready for operation.

Ratio of civilian to defense consumption of metals has been growing steadily in the last year. A period of transition into more civilian production won't be necessary. Most nonferrous metals today are in adequate supply, some are overplentiful. Chief among those metals not available for the asking are nickel and some aluminum and brass mill products.

Spread It Around—Brass mill products used to conduct a shooting war would ease perceptibly. Pressure put on producers after the ammo shortage investigation has required a lot of shell brass. Setasides under the Defense Materials System may be reduced to allow civilian producers more metal. DMS calls for 55 per cent of the brass seamless tube and pipe, 40 per cent of the rod, bar, shapes and wire, 30 per cent of the sheet, strip, plate and rolls.

Some industry men doubt if all that is needed, yet civilian demand is already satisfied in such items as screw machine stock, pipe, sheet and strip. Wire mills are required to set aside 26 per cent of their output, yet few carry more than 20 per cent defense orders.

Change for Aluminum—Psychological effect of truce might mean easing further the stockpile take of aluminum if present strong demand persists. Aluminum producers will badger the government to do so as the golden opportunity to cement peacetime markets is now before them.

Nickel could be released gradually from the maze of restrictions on its use, but long-term defense needs call for caution. Lining up of long-term supply sources increases the likelihood of the government loosening the reins.

U.S. Lines Up More Nickel

To bolster the supply of nickel for the United States, the Defense Materials Procurement Agency signed a contract designed to bring enough ore from an undeveloped deposit in British Columbia to yield up to 56 million pounds of the refined metal.

The new project is to be undertaken by Western Nickel, a wholly owned subsidiary of Pacific Nickel Mines Ltd., Vancouver, B. C., and Newmont Mining Corp., New York.

Western Nickel will continue explorations of an ore body in the Yale district of British Columbia at its own expense. Upon completion of exploration, the company will develop the property for large-scale mining at a cost of about $750,000, half of which will be paid by the government.

Then if the company and government agree to go ahead with production the government will advance up to $2,625,000 and the company will put up $950,000 of its own funds for facilities.

Production is scheduled to start Mar. 1, 1955, and is to continue at the rate of 6 million pounds of refined nickel a year for the next seven years. The government will get all of the nickel at the market price at the time of delivery.

What's Supporting Copper?

Copper users are wondering what has held the price up so well. Even in trading on the Commodity Exchange, year end copper brings over 25 cents. Chilean copper is beginning to go begging and government authorities in Chile are meeting to decide what to do about it. Pricing by fabricators still is based on using a portion of Chilean copper, yet many of them are buying all their needs at two to three cents under the level they're charging. When customers start pressuring the independent wire or brass mills, buying prices will have to be readjusted and the whole house of cards could start a tumble.

Tin Trends Downward

Speculators and switch-sterling operators still are devoting a lot of attention to tin trading on various metal exchanges. Price has been inversely proportional to the success of truce talks, and last week sank to new lows. One trader points out, however, that normally more tin is consumed in peacetime than during war. With every drop in tin prices the chances of contract settlement with Bolivia for her tin become more remote.

Zinc Maintains Stability

Zinc market maintains its stability and May production statistics, reported by the American Zinc Institute, reflect it. Production in May amounted to 82,422 tons, an increase of 2000 tons over April. Stocks were reduced by 5600 tons and backlog climbed 5000 tons. These should be encouraging trends for producers. As a result of last month's purchases by General Services Administration, shipments on government accounts were highest since 1950. Zinc consumption is currently running at a rate of 200,000 tons better than last year.

Nonferrous Briefs

Copper scrap buying prices are being shaved again, though No. 1 copper is still in strong demand. No. 2 copper brings 22.5 cents at most refineries.

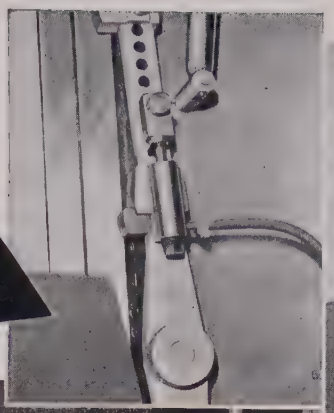
Lead demand is cooling off temporarily as most users get their orders in. Batterymakers expect to produce 15 per cent more units this year than last, consuming over 400,000 tons of lead in the process.

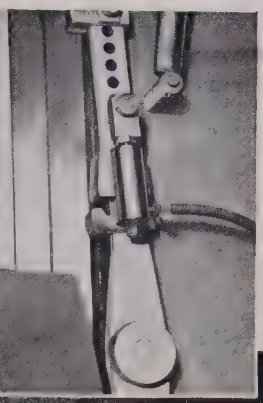
Some metal men believe the sliding scale tariff on lead and zinc isn't dead yet, pointing out that the administration must have promised something to Representative Simpson to get him to split his controversial bill.

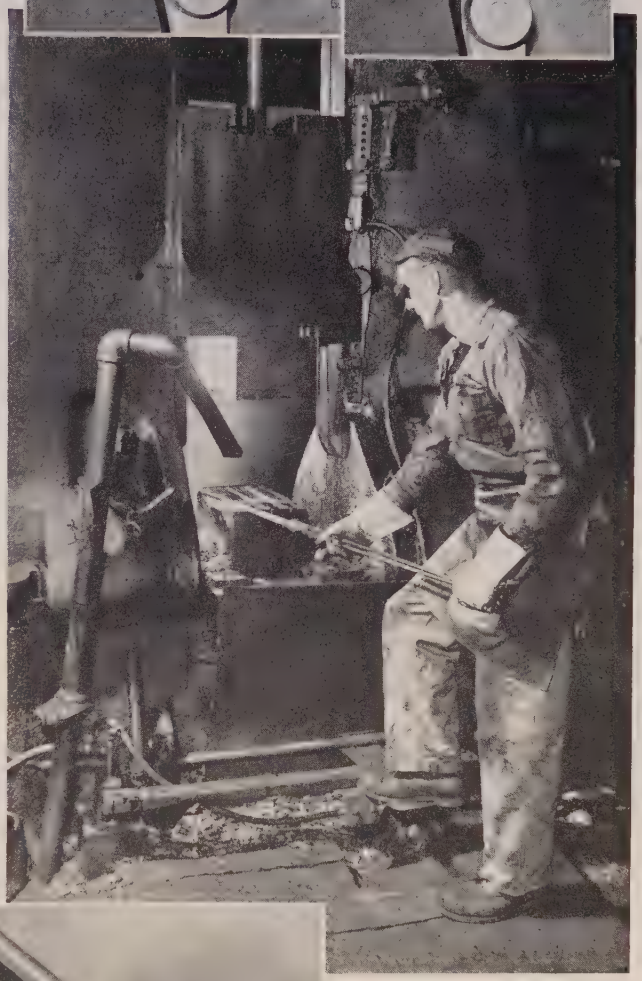
Zinc die-castings are reportedly in disrepute in Europe because of total neglect of specifications by suppliers. Germans and Belgians are said to be worst offenders, the British more careful.

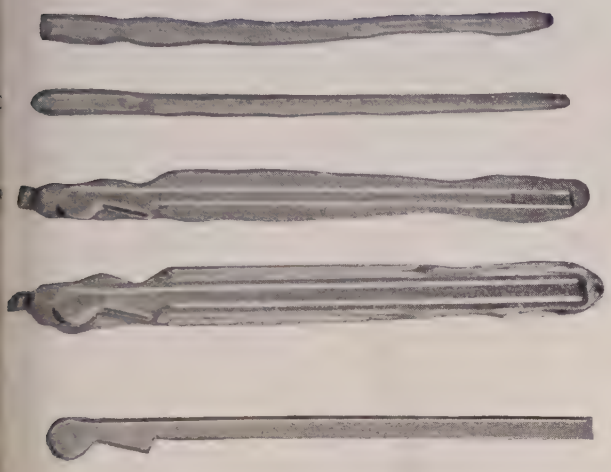
CECO-DROP SHORT STROKE CONTROL

"Makes the Hammer Talk!"



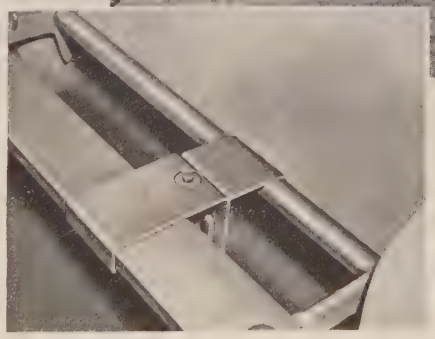






An installation of a Short Stroke Control on a 2500 lb. CHAMBERSBURG CECO-DROP HAMMER is shown, forging steel ankle joints for leg braces. Above are samples of the forging as it appears during various stages. The forging process begins with a series of 20 to 23 short, rapid blows (about 18" stroke) to draw the 2 3/32" dia. stock. This is followed by two long blows (about 35" stroke) to roll it, three more long blows in the rough impression, and three more long blows to complete the forging. After the last blow the ram is stopped on the up-stroke at the "short blow" position for the next forging.

Short Stroke Control is but one of the many features of Chambersburg CECO-DROPS. These piston lift, gravity drop hammers are setting new standards in forge shop production. Lower operating costs, minimum down time, easy operation, wide range of operations, extra safety; all add up to "more forging per hour" the basis on which to judge the efficiency of a Drop Hammer. Write for Bulletin 11-L-0.



(Above right) Dog in full stroke Position. Wedge is lifted, Short Stroke Control is inoperative.

(Above left) Dog in Short Stroke Position. Wedge is down, holding dog in operating position.

(Lower left) Button on treadle when depressed by operator shortens the stroke. Release reverts to full stroke.

CHAMBERSBURG ENGINEERING COMPANY, CHAMBERSBURG, PA.

CHAMBERSBURG

THE HAMMER BUILDERS

Semifinished and Finished Steel Products

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on pages 146-147.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$81.00
Munhall,Pa. U5 .....54.00
Seattle S24 .....75.00

INGOTS Alloy (NT)
Detroit R7 .....$57.00
Fontana,Calif. K1 ....83.00
Houston S5 .....65.00
Midland,Pa. C18 .....57.00
Munhall,Pa. U5 .....57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$59.00
Clairton,Pa. U5 .....59.00
Ensley,Ala. T2 .....59.00
Fairfield,Ala. T2 .....59.00
Fontana,Calif. K1 ....78.00
Gary,Ind. U5 .....59.00
Johnstown,Pa. B2 .....59.00
Lackawanna,N.Y. B2 ..59.00
Munhall,Pa. U5 .....59.00
So.Chicago,Ill. U5 ....59.00
So.Duquesne,Pa. U5 ..59.00

Carbon, Forging (NT)
Bessemer,Pa. U5 .....$70.50
Buffalo R2 .....70.50
Canton,O. R2 .....70.50
Clairton,Pa. U5 .....70.50
Cleveland R2 .....70.50
Conshohocken,Pa. A3 ..77.50
Detroit R7 .....73.50
Ensley,Ala. T2 .....70.50
Fairfield,Ala. T2 .....70.50
Fontana,Calif. K1 ....89.50
Gary,Ind. U5 .....70.50
Geneva,Utah C11 .....70.50
Houston S5 .....78.50
Johnstown,Pa. B2 ....70.50
Lackawanna,N.Y. B2 ..70.50
LosAngeles B3 .....89.50
Munhall,Pa. U5 .....70.50
Seattle B3, S24 .....89.50
So.Chicago R2,U5,W14.70.50
So.Duquesne,Pa U5 ...70.50
So.SanFrancisco B3 ..89.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$76.00
Buffalo R2 .....76.00
Canton,O. R2 .....76.00
Canton,O. T7 .....78.60
Conshohocken,Pa. A3 ..83.00
Detroit R7 .....79.00
Fontana,Calif. K1 ....95.00
Gary,Ind. U5 .....76.00
Houston S5 .....84.00
Ind.Harbor,Ind. Y1 ....76.00
Johnstown,Pa. B2 ....76.00
Lackawanna,N.Y. B2..76.00
LosAngeles B3 .....96.00
Massillon,O. R2 .....76.00
Midland,Pa. C18 .....76.00
Munhall,Pa. U5 .....76.00
Seattle S24 .....96.00
So.Chicago R2,U5,W14.76.00
So.Duquesne,Pa. U5 ..76.00
Struthers,O. Y1 .....76.00
Warren,O. C17 .....76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$87.50
Canton,O. R2 .....87.50
Cleveland R2 .....87.50
Fontana,Calif. K1 ....108.50
Gary,Ind. U5 .....87.50
Massillon,O. R3 .....87.50
So.Chicago,Ill. R2 ....87.50
So.Duquesne,Pa. U5 ..87.50

SHEET BARS (NT)
Fontana,Calif. K1 ...$93.18

SKELP
Aliquippa,Pa. J5 .....3.65
Munhall,Pa. U5 .....3.55
Warren,O. R2 .....3.55
Youngstown R2, U5 ...3.55

WIRE RODS
Alton,Ill. L1 .....4.70
AlabamaCity,Ala. R2 ..4.325
Buffalo W12 .....4.325
Cleveland A7 .....4.325
Donora,Pa. A7 .....4.325
Fairfield,Ala. T2 .....4.325
Fontana,Calif. K1 ....5.125
Houston S5 .....4.725
Johnstown,Pa. B2 ....4.325
Joliet,Ill. A7 .....4.325
KansasCity,Mo. S5 ....4.665
LosAngeles B3 .....5.125
Minnequa,Colo. C10 ...4.575
Monessen,Pa. P7 .....4.525
No.Tonawanda,N.Y.B11 4.325
Pittsburg,Calif. C11 ...4.975
Portsmouth,O. P12 ....4.525
Roebling,N.J. R5 ....4.425
So.Chicago,Ill. R2 ....4.325
SparrowsPoint,Md. B2..4.425
Sterling,Ill.(1) N15 ...4.325
Struthers,O. Y1 .....4.325
Torrance,Calif. C11 ...5.125
Worcester,Mass. A7 ...4.625

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ...4.675
Lackawanna,N.Y. B2 ..4.675
Munhall,Pa. U5 ... 4.675
So.Chicago,Ill. U5 ....4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.85
Aliquippa,Pa. J5 .....3.85
Bessemer,Ala. T2 .....3.85
Bethlehem,Pa. B2 ....3.90
Clairton,Pa. U5 .....3.85
Fairfield,Ala. T2 .....3.85
Fontana,Calif. K1 ....4.50
Gary,Ind. U5 .....3.85
Geneva,Utah C11 .....3.85
Houston S5 .....4.25
Ind.Harbor,Ind. I-2 ....3.85
Johnstown,Pa. B2 .....3.90
KansasCity, Mo. S5 ....4.45
Lackawanna,N.Y. B2 ..3.90
LosAngeles B3 .....4.45
Minnequa,Colo. C10 ...4.30
Munhall,Pa. U5 .....3.85
Niles,Calif.(22) P1 .....4.56
Phoenixville,Pa. P4 ....4.95
Seattle B3 .....4.50
So.Chicago,Ill. U5, W14.3.85
So.SanFrancisco B3 ....4.40
Torrance,Calif. C11 ....4.45
Weirton,W.Va. W6 ....4.10

Wide Flange
Bethlehem,Pa. B2 .....3.90
Clairton,Pa. U5 .....3.85
Fontana,Calif. K1 .....5.05
Lackawanna,N.Y. B2 ..3.90
Munhall,Pa. U5 .....3.85
So.Chicago,Ill. U5 .....3.85

Alloy Stand. Shapes
Clairton,Pa U5 .....4.725
Fontana,Calif. K1 ....6.125
Gary,Ind. U5 .....4.725
Munhall,Pa. U5 .....4.725
So.Chicago,Ill. U5 ....4.725

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.80
Bessemer,Ala. T2 .....5.80
Bethlehem,Pa. B2 .....5.80
Clairton,Pa. U5 .....5.80
Fairfield,Ala. T2 .....5.80
Fontana,Calif. K1 ....6.45
Gary,Ind. U5 .....5.80
Geneva,Utah C11 .....5.80
Ind.Harbor,Ind. I-2 ....5.80
Ind.Harbor,Ind. Y1 ....6.30
Johnstown,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
LosAngeles B3 .....6.35
Munhall,Pa. U5 .....5.80
Seattle B3 .....6.40
So.Chicago,Ill U5 .....5.80
So.SanFrancisco B3 ..6.30
Struthers,O. Y1 .....6.30

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
Munhall,Pa. U5 .....5.75
So.Chicago,Ill. U5 .....5.75

BEARING PILES
Munhall,Pa. U5 .....3.85
So.Chicago,Ill. U5 .....3.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.95
Bessemer,Ala. T2 .....5.95
Clairton,Pa. U5 .....5.95
Cleveland J5, R2 .....5.95
Conshohocken,Pa. A3 ...6.20
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....5.95
Fontana,Calif.(30) K1 ..6.65
Gary,Ind. U5 .....5.95
Geneva,Utah C11 .....5.95
Ind.Harbor,Ind. I-2 ...5.95
Ind.Harbor,Ind. Y1 ....6.45
Johnstown,Pa. B2 ....5.95
Munhall,Pa. U5 .....5.95
Pittsburgh J5 .....5.95
Seattle B3 .....6.85
Sharon,Pa. S3 .....5.95
So.Chicago,Ill. U5 .....5.95
SparrowsPoint,Md. B2..5.95
Warren,O. R2 .....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 .....5.35
Coatesville,Pa. L7 .....5.75
Conshohocken,Pa. A3 ..5.55
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 .....5.25
Johnstown,Pa. B2 .....5.25
Munhall,Pa. U5 .....5.25
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.25
SparrowsPoint,Md. B2..5.25

FLOOR PLATES
Cleveland J5 .....4.95
Conshohocken,Pa. A3 ..4.95
Ind.Harbor,Ind. I-2 ....4.95
Munhall,Pa. U5 .....4.95
So.Chicago,Ill. U5 ....4.95

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ..4.15
Cleveland,c.l. R2 .....4.50
Warren O., c.l R2 ....4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.90
Aliquippa,Pa. J5 .....3.90
Ashland,Ky. (15) A10 ..3.90
Bessemer,Ala. T2 .....3.90
Clairton,Pa. U5 .....3.90
Claymont,Del. C22 ....4.35
Cleveland J5, R2 .....3.90
Coatesville,Pa. L7 .....4.35
Conshohocken,Pa. A3 ..4.35
Ecorse,Mich G5 .....4.45
Fairfield,Ala. T2 .....3.90
Fontana,Calif.(30) K1..4.55
Gary,Ind. U5 .....3.90
GraniteCity,Ill. G4 ....4.60
Geneva,Utah C11 .....3.90
Harrisburg,Pa. C5 .....6.50
Houston S5 .....4.30
Ind.Harbor,Ind. I-2, Y1.3.90
Johnstown,Pa. B2 ....3.90
Lackawanna,N.Y. B2 ..3.90
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....3.90
Pittsburgh J5 .....3.90
Seattle B3 .....4.80
Sharon,Pa. S3 .....4.15
So.Chicago,Ill. U5, W14.3.90
SparrowsPoint,Md. B2 3.90
Steubenville,O. W10 ....3.90
Warren,O. R2 .....3.90
Weirton,W.Va. W6 .....4.20
Youngstown R2, U5, Y1.3.90

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.70
Geneva, Utah C11 .....5.05

PLATES, Wrought Iron
(Add 4.7% to base, extras)
Economy,Pa. B14 ....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.95
Aliquippa,Pa. J5 .....3.95
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.95
Buffalo R2 .....3.95
Canton,O. R2 .....3.95
Clairton,Pa. U5 .....3.95
Cleveland R2 .....3.95
Detroit R7 .....4.10
Ecorse,Mich. G5 .....4.30
Emeryville,Calif. J7 ....4.70
Fairfield,Ala. T2 .....3.95
Fontana,Calif. K1 ....4.65
Gary,Ind. U5 .....3.95
Houston S5 .....4.35
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 .....3.95
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ..3.95
LosAngeles B3 .....4.65
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.40
Niles,Calif. P1 .....4.65
N.Tonawanda,N.Y. B11.3.95
Pittsburg,Calif. C11 ....4.65
Pittsburgh J5 .....3.95
Portland,Oreg. O4 .....4.70
Seattle B3, N14, S24 ..4.70
So.ChicagoR2,U5,W14 ..3.95
So.Duquesne,Pa. U5 ...3.95
So.SanFran.,Calif. B3...4.70
Sterling,Ill. N15 .....4.55
Struthers,O. Y1 .....3.95
Torrance,Calif. C11 ....4.65
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5 ....3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.925
Gary,Ind. U5 .....4.925
Youngstown U5 .....4.925

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.95
Atlanta A11 .....4.25
Niles,Calif. P1 .....4.65
SanFrancisco S7 .....5.00

BAR SIZE ANGLES;H.R.CARBON
Bethlehem,Pa. B2 .....4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2.....4.675
Buffalo R2 .....4.675
Canton,O. T7 .....4.72
Canton,O. R2 .....4.675
Clairton,Pa. U5 .....4.675
Detroit R7 .....4.825
Ecorse,Mich. G5 .....5.025
Fontana,Calif. K1 ....5.725
Gary,Ind. U5 .....4.675
Houston S5 .....5.075
Ind.Harbor,Ind. I-2, Y1.4.675
Johnstown,Pa. B2 ....4.675
KansasCity,Mo. S5 ....5.275
Lackawanna,N.Y. B2..4.675
LosAngeles B3 .....5.725
Massillon,O. R2 .....4.675
Midland,Pa. C18 .....4.675
So.Chicago R2,U5,W14.4.675
So.Duquesne,Pa. U5 ..4.675
Struthers,O. Y1 .....4.675
Warren,O. C17 .....4.675
Youngstown U5 .....4.675

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.925
Bessemer,Ala. T2 .....5.925
Bethlehem,Pa. B2 .....5.925
Clairton,Pa. U5 .....5.925
Cleveland R2 .....5.925
Ecorse,Mich G5 .....6.675
Fairfield Ala T2 ....5.925
Fontana,Calif. K1 ....7.175
Gary,Ind. U5 .....5.925
Ind.Harbor,Ind. I-2 ...5.925
IndianaHarbor,Ind. Y1.6.425
Johnstown,Pa. B2 ....5.925
Lackawanna,N.Y. B2 ..5.925
LosAngeles B3 .....6.625
Pittsburgh J5 .....5.925
Seattle B3 .....6.675
So.Duquesne,Pa. U5 ..5.925
So.SanFrancisco B3 ...6.675
Struthers,O. Y1 .....6.425
Youngstown U5 .....5.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ...4.925
BeaverFalls,Pa. R2 ...4.925
BeaverFalls,Pa. M12 ..4.925
Buffalo B5 .....4.975
Camden,N.J. P13 .....5.375
Carnegie,Pa. C12 .....4.925
Chicago B5 .....4.925
Chicago W18 .....4.925
Cleveland A7, C20 ....4.925
Detroit P17, R7 .....5.075
Detroit B5 .....5.125
Donora,Pa. A7 .....4.925
Elyria,O W8 .....4.925
FranklinPark,Ill. N5 ..4.925
Gary,Ind. R2 .....4.925
GreenBay,Wis. F7 ....4.925
Hammond,Ind L2,M13.4.925
Hartford,Conn. R2 ....5.475
LosAngeles R2 .....6.375
Mansfield,Mass. B5 ...5.475
Massillon,O. R2, R8 ..4.925
Monaca,Pa. S17 .....4.925
Newark,N.J. W18 .....5.375
Plymouth,Mich. P5 ...5.175
Pittsburgh J5 .....4.925
Putnam,Conn. W18 ...5.475
Readville,Mass. C14 ...5.475
St.Louis,Mo. M5 .....
So.Chicago,Ill. W14 ....
SpringCity,Pa. K3 ....
Struthers,O. Y1 .....
Waukegan,Ill. A7 .....
Youngstown Y1 .....
Youngstown F3 .....

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....
BeaverFalls,Pa. M12 .
Bethlehem,Pa. B12 ...
Buffalo B5 .....
Camden,N.J. P13 .....
Canton,O. R2 .....
Canton,O. T7 .....
Carnegie,Pa. C12 .....
Chicago. B5 .....
Chicago W18 .....
Cleveland A7 .....
Cleveland C20 .....
Detroit P17, R7 ....
Detroit B5 .....
Donora,Pa. A7 .....
Elyria,O. W8 .....
Gary,Ind. R2 .....
Hammond,Ind. L2,M1
Hartford,Conn. R2 ...
Lackawanna,N.Y. B2
Mansfield,Mass B5 ...
Massillon,O. R2,R8 ..
Midland,Pa. C18 .....
Monaca,Pa. S17 .....
Newark,N.J. W18 ....
Plymouth,Mich. P5 ...
So.Chicago,Ill. R2, WF
SpringCity,Pa. K3 ...
Struthers,O. Y1 .....
Warren,O. C17 .....
Waukegan,Ill. A7 ....
Worcester,Mass, A7 .
Youngstown Y1 .....
Youngstown F3 .....

BARS, Reinforcing (Fabricated)
AlabamaCity,Ala. R2 .
Atlanta A11 .....
Buffalo R2 .....
Cleveland R2 .....
Emeryville,Calif. J7 ...
Fairfield,Ala. T2 ....
Fontana,Calif. K1 ...
Gary,Ind. U5 .....
Houston S5 .....
Ind.Harbor,Ind. I-2, Y
Johnstown,Pa. B2 .....
KansasCity,Mo. S5 ....
Lackawanna,N.Y. B2
LosAngeles B3 .....
Milton,Pa. B6 .....
Minnequa,Colo. C10 ..
Niles,Calif. P1 .....
Pittsburg,Calif. C11
Pittsburgh J5 .....
SandSprings,Okla. S5
Seattle B3, N14, S24
So.Chicago,Ill. R2 ...
So.Duquesne,Pa U5 ...
So.SanFrancisco B3 ..
SparrowsPoint,Md. B2
Sterling,Ill. (1) N15 .
Struthers,O. Y1 .....
Torrance,Calif C11 ...
Youngstown R2, U5 ...

BARS, Reinforcing (Fabricated; to consumer)
Huntington,W.Va. W7 ...
Johnstown, ¼-1" B2 ...
KansasCity S5 .....
LosAngeles B3 .....
Marion,O P11 .....

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel& Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Div., H. K. Porter Co.
B14 A. M. Byers Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel
G2 Globe Iron Co.
G3 Globe Steel Tubes
G4 Granite City Steel
G5 Great Lake Steel
G6 Greer Steel Co.
H1 Hanna Furnace
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Co
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel &
J1 Jackson Iron & Ste
J3 Jessop Steel Co.
J4 Johnson Steel &
J5 Jones & Laughlin
J6 Joslyn Mfg. & Sup
J7 Judson Steel Corp.
J8 Jersey Shore Steel
K1 Kaiser Steel Corp.
K2 Keokuk Electro M
K3 Keystone Drawn S
K4 Keystone Steel &
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & S
L6 Lone Star Steel Co
L7 Lukens Steel Co.

eattle B3 N14 .....5.80
nd Springs S5 .....6.45
n.SanFrancisco B3 ...5.45
arrowsPt. ¼-1" B2 ..5.25
illiamsport,Pa. S19 ...5.35

AIL STEEL BARS
icagoHts.(3,4) C2 ...4.75
icagoHts.(3,4) I-2 ...4.75
anklin,Pa.(3,4) F5 ...4.75
rtWorth,Tex.(26) T4..4.85
untngt,W.Va.(3) W7 ..5.75
arion,O.(3) P11 .....4.75
oline,Ill.(3) R2 .....4.05
onawanda(3,4) B12 ..5.00
illiamsport(3) S19 ...5.25
illiamsport,Pa. S19 ...5.35

ARS, Wrought Iron
(Add 4.7% to base and extras)
conomy,Pa.(S.R.) B14.9.60
conomy,Pa.(D.R.)B14 11.90
conomy(Staybolt) B14 12.20
cK.Rks.(Staybolt) L5.14.50
cK.Rks.(S.R.) L5 ....9.60
cK.Rks.(D.R.) L5 ...13.00

HEETS, Hot-Rolled Steel
(18 gage and heavier)
labamaCity,Ala. R2 ..3.775
shland,Ky.(8)A10 ...3.775
utler,Pa. A10 .....3.775
eveland J5, R2 .....3.775
onshohocken,Pa. A3 ..4.175
etroit M1 .....4.40
ecorse,Mich. G5 .....3.975
airfield,Ala. T2 .....3.775
ontana,Calif. K1 ....4.825
ary,Ind. U5 .....3.775
eneva,Utah C11 ....3.875
raniteCity,Ill. G4 ....4.30
id.Harbor,Ind. I-2, Y1 3.775
vin,Pa. U5 .....3.775
ackawanna,N.Y. B2 ..3.775
unhall,Pa. U5 .....3.775
iles,O. N12 .....5.425
ttsburg,Calif. C11 ..4.475
ittsburgh J5 .....3.775
aron,Pa. S3 .....4.175
p.Chicago,Ill. W14 ...3.775
arrowsPoint,Md. B2.3.775
eubenville,O. W10 ..3.775
orrance,Calif. C11 ...4.475
arren,O. R2 .....3.775
eirton,W.Va. W6 ....3.775
estLeechburg,Pa. A4.3.925
oungstown U5, Y1 ..3.775

HEETS, H.R. (19 gage)
labamaCity,Ala. R2 ..4.925
over,O. R1 .....5.825
ansfield,O. E6 .....5.65
iles,O. N12 .....5.675
orrance,Calif. C11 ...5.575

HEETS, Cold-Rolled
High-Strength Low-Alloy
eveland J5, R2 ....6.925
ecorse,Mich. G5 .....7.475
ontana,Calif. K1 ....7.975
ary Ind. U5 .....6.925
idianaHarbor,Ind. Y1.7.425
idianaHarbor,Ind. I-2.6.925
vin,Pa. U5 .....6.925
ackawanna(37) B2 ..6.925
ttsburgh J5 .....6.925
arrowsPoint(38) B2..6.925
arren,O. R2 .....6.925
eirton,W.Va. W6 ....7.275
oungstown Y1 .....7.425

HEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy
eveland J5, R2 ....5.675
onshohocken,Pa. A3 ..5.925
ecorse,Mich. G5 .....6.225
airfield,Ala. T2 ....5.675
ontana,Calif. K1 ....6.775

Gary,Ind. U5 .....5.675
Ind.Harbor,Ind. I-2 ...5.675
Ind.Harbor,Ind. Y1 ...6.175
Irvin,Pa. U5 .....5.675
Lackawanna(35) B2 ..5.675
Munhall,Pa. U5 .....5.675
Pittsburgh J5 .....5.675
Sharon,Pa. S3 .....5.675
So.Chicago,Ill. U5 ...5.675
SparrowsPoint(36) B2..5.675
Warren,O. R2 .....5.675
Weirton,W.Va. W6 ....6.025
Youngstown U5 .....5.675
Youngstown Y1 .....6.175

SHEETS, Cold-Rolled Steel
(Commercial Quality)
Butler,Pa. A10 .....4.575
Cleveland J5, R2 ....4.575
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 ....4.575
Follansbee,W.Va. F4 ..5.575
Fontana,Calif. K1 ....5.675
Gary,Ind. U5 .....4.575
GraniteCity,Ill. G4 ....5.275
Ind.Harbor,Ind. I-2,Y1.4.575
Irvin,Pa. U5 .....4.575
Lackawanna,N.Y. B2 ..4.575
Middletown,O. A10 ....4.575
Pittsburg,Calif. C11 ...5.525
Pittsburgh J5 .....4.575
SparrowsPoint,Md. B2..4.575
Steubenville,O. W10 ...4.575
Warren,O. R2 .....4.575
Weirton,W.Va. W6 ....4.575
WestLeechburg,Pa. A4..5.45
Youngstown Y1 .....4.575

SHEETS, Galv'd No. 10 Steel
AlabamaCity,Ala. R2 ..5.075
Ashland,Ky.(8) A10 ...5.075
Canton,O. R2 .....5.075
Delphos,O N16 .....5.675
Dover,O. R1 .....5.475
Fairfield,Ala. T2 .....5.075
Gary,Ind. U5 .....5.075
GraniteCity,Ill. G4 ....5.275
Ind.Harbor,Ind. I-2 ...5.075
Irvin Pa U5 .....5.075
Kokomo,Ind.(13) C16 ..5.325
Martin Ferry,O. W10 ...5.075
Niles,O. N12 .....6.275
Pittsburg,Calif. C11 ...5.825
SparrowsPoint,Md. B2 .5.075
Steubenville,O. W10 ...5.075
Torrance,Calif. C11 ...5.825
Weirton,W.Va. W6 ....5.075

SHEETS, Galvanized No. 10, High-Strength Low-Alloy
Irvin,Pa. U5 .....7.625
SparrowsPoint(39) B2..7.775

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.625
Irvin Pa U5 .....5.625
Kokomo,Ind.(13) C16 ..5.875
Niles,O. N12 .....6.825

SHEETS ZINCGRIP STEEL No. 10
Butler,Pa. A10 .....5.325
Middletown,O. A10 ....5.325

SHEETS, Electro Galvanized
Cleveland R2 (28) 5.925
Niles,O. R2 (28) 5.925
Weirton,W.Va. W6 ....5.775

SHEETS, Well Casing
Fontana,Calif. K1 .....5.34

BLUED Stock, 29 ga.
Yorkville,O. W10 .....7.00
Follansbee,W.Va. F4 ...7.10
Follansbee (23) F4 ....6.425

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..4.925
Cleveland R2 .....4.925
Gary,Ind. U5 .....4.925

GraniteCity,Ill. G4 ....5.625
Ind.Harbor,Ind. I-2 ...4.925
Irvin,Pa. U5 .....4.925
Middletown,O. A10 ....4.925
Youngstown Y1 .....4.925

BLACK PLATE
(Base Box)
Aliquippa,Pa. J5 .....$6.50
Fairfield,Ala. T2 .....6.60
Gary,Ind. U5 .....6.50
GraniteCity,Ill. G4 ....6.70
Ind.Harbor,Ind. I-2, Y1.6.50
Irvin,Pa. U5 .....6.50
Niles,O. R2 .....6.50
Pittsburg,Calif. C11 ....7.25
SparrowsPoint,Md. B2 ..6.60
Warren,O. R2 .....6.50
Weirton,W.Va. W6 ....6.50
Yorkville,O. W10 .....6.50

HOLLOWARE ENAMELING
Black Plate (29 gage)
Follansbee,W.Va. F4 ...6.10
Gary,Ind. U5 .....6.10
GraniteCity,Ill. G4 ....6.30
Ind.Harbor,Ind. Y1 .....6.10
Irvin,Pa. U5 .....6.10
Yorkville,O. W10 .....6.35

SHEETS, Culvert No. 16	Cu	Cu Alloy	Fe
Ashland,Ky. A10	5.875	....	
Canton,O. R2 ..	5.925	6.375	
Fairfield,Ala. T2	5.875	6.125	
Gary,Ind. U5 ...	5.875	6.125	
Ind.Harbor I-2 .	5.875	6.125	
Irvin,Pa. U5 ...	5.875	6.125	
Kokomo,Ind. C16	6.525	....	
MartinsFy.,O.W10	5.875	....	
Pittsburg,Cal.C11	6.625	....	
SparrowsPt. B2.	5.875	....	
Torrance,Cal.C11	6.625	....	

SHEETS, Culvert, No. 16 Pure Iron
Ashland,Ky. A10 .....6.125
Fairfield,Ala. T2 .....6.125
MartinsFerry,O. W10 ..6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier
Ashland,Ky.(8) A10 ..4.025
Cleveland R2 .....4.375
Ind.Harbor,Ind. I-2 ...4.025
Warren,O. R2 .....4.375

SHEETS, Cold-Rolled Ingot Iron
Butler,Pa. A10 .....5.075
Cleveland R2 .....5.175
Middletown,O. A10 ....5.075
Warren,O. R2 .....5.175

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky.(8) A10 ...5.325
Canton,O. R2 .....5.825

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 .....5.575
Middletown,O. A10 ....5.575

SHEETS, ALUMINIZED
Butler,Pa. A10 .....8.425

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....5.875

MANUFACTURING TERNES
(Special Coated)
Fairfield,Ala. T2 .....$7.85
Gary,Ind. U5 .....7.75
Irvin,Pa. U5 .....7.75
Yorkville,O. W10 .....7.75

SHEETS, LT. Coated Ternes, 6 lb
Yorkville,O. W10 ....$8.65

SHEETS, Mfg. Ternes, 8 lb
(Commercial Quality)
Gary,Ind. U5 .....$9.75
Yorkville,O. W10 .....9.75

SHEETS, Long Terne Steel
(Commercial Quality)
BeechBottom,W.Va.W10 5.475
Gary,Ind. U5 .....5.475
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....5.475
Niles,O. N12 .....6.275
Weirton,W.Va. W6 ....5.475

ROOFING SHORT TERNES
(8 lb Coated)
Gary,Ind. U5 .....9.75

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2.	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1.	8.70	8.95
Irvin,Pa. U5 ...	8.70	8.95
Pitts.,Cal. C11 ..	9.45	9.70
Sp.Pt.,Md. B2 ..	8.80	9.05
Warren,O. R2 ..	8.70	...
Weirton,W.Va.W6	8.70	8.95
Yorkville,O. W10.	8.70	8.95

STRIP, Hot-Rolled
High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.65
Conshohocken,Pa. A3....5.90
Ecorse,Mich. G5 .....6.30
Fairfield,Ala. T2 .....5.65
Fontana,Calif. K1 ....6.75
Gary,Ind. U5 .....5.65
Ind.Harbor,Ind. I-2.....5.65
Ind.Harbor,Ind. Y1 ....6.15
Lackawanna,N.Y. B2 ..5.70
LosAngeles(25) B3 ....6.40
Seattle(25) B3 .....6.65
Sharon,Pa. S3 .....5.65
So.SanFrancisco(25) B3.6.40
SparrowsPoint,Md. B2..5.70
Warren,O. R2 .....5.65
Weirton,W.Va. W6 ....6.10
Youngstown Y1 .....6.15
Youngstown U5 .....5.65

STRIP, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5 .....7.45
Cleveland A7 .....7.30
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.15
Lackawanna,N.Y. B2 ..7.90
Sharon,Pa. S3 .....7.30
SparrowsPoint,Md. B2 .7.90
Warren,O. R2 .....7.30
Weirton,W.Va. W6 ....7.95
Youngstown Y1 .....7.80

STRIP, Cold-Rolled Alloy Steel
Bridgeprt,Conn.(10)S15 12.15
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....11.40
Dover,O. G6 .....11.90
Fontana,Calif. K1 .....13.30
Harrison,N.J. C18 .....12.00
Midland,Pa. C18 .....12.00
NewBritn,Conn.(10)S15 12.15
Pawtucket,R.I.(11) N8 12.15
Pawtucket,R.I.(12) N8.12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...11.70
Youngstown C8 .....12.00

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ..3.975
Warren,O. R2 .....4.325

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....5.70

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	...	...
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	...	...	7.85	9.10	9.90
Brackenridge,Pa. A4	...	...	8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	7.55	7.85	(34)	(41)	...
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Newport,Ky. N9 (cut lengths)	...	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	7.05	7.35	7.85	...	...
Vandergrift,Pa. U5	...	7.85	8.35	9.60	10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O. A10	...	7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95	....	....	....
Newport,Ky. N9 (cut lengths).	10.45	....	....	....
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95	....	....	....
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1	...	...	8.55	10.50	....
Carnegie,Pa. S18	...	7.65	8.25	10.30	12.50
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50	....	....
Detroit D2	6.45	7.50	8.10	....	....
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
FranklinPark,Ill. T6	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18	...	...	8.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	....
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2	6.70	7.60	8.20	....	....
NewYork W3	...	7.95	8.55	10.50	12.80
Pawtucket,R.I. N8: Cleve.orPitts.Base	...	7.65	8.25	10.20	12.50
Worcester,Mass.,Base.	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5	...	7.95	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	8.20	10.15	12.65
Warren,O. T5	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8	...	7.65	8.25	10.20	12.50
Spring Steel (Tempered)					
Trenton,N.J. R5 (29)	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	..	...	10.30*	12.50*	15.35*
Youngstown C8	...	...	10.30	12.50	15.35

* Plus $1.575 per 100 lb.

McLouth Steel Corp.
Mahoning Valley Steel
Medart Co.
Mercer Tube & Mfg. Co.
Mid-States Steel & Wire
Moltrup Steel Products
Monarch Steel Co.

National Supply Co.
National Tube Div.
Nelsen Steel & Wire Co.
NewEng.-HighCarb.Wire
Newman-Crosby Steel
Newport Steel Corp.
Niles Rolling Mill Div.
Nrthwst. Steel Roll. Mills
Northwestern S.&W. Co.
New Delphos Mfg. Co.

Oliver Iron & Steel Corp.
Oregon Steel Mills

Pacific States Steel Corp.
Pacific Tube Co.
Phoenix Iron & Steel Co.
Pilgrim Drawn Steel
Pittsburgh Coke & Chem.
Pittsburgh Steel Co.
Pittsburgh Tube Co.
Pollak Steel Co.
Portsmouth Division,
Detroit Steel Corp.

P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,Eaton Mfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Div.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.

U4 Universal Cyclops Steel
U5 United States Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2...3.725
Alton,Ill. L1 .....4.20
Ashland,Ky.(8)A10 ..3.725
Atlanta A11 .....4.275
Bessemer,Ala. T2 ....3.725
Bridgeport,Con.(10)S15 4.225
Buffalo(27) R2 .....3.725
Butler,Pa. A10 .....3.725
Carnegie,Pa. S18 ....4.225
Conshohocken,Pa. A3 ..4.125
Detroit M1 .....4.40
Ecorse,Mich. G5 .....4.025
Fairfield,Ala. T2 ....3.725
Fontana,Calif. K1 ....5.175
Gary,Ind. U5 .....3.725
Houston,Tex. S5 .....4.125
Ind.Harbor,Ind. I-2,Y1.3.725
Johnstown,Pa.(25) B2..3.725
KansasCity,Mo.(9) S5..4.325
Lackw'na,N.Y.(32) B2 3.725
LosAngeles(25) B3 ....4.475
Milton,Pa. B6 .....4.35
Minnequa,Colo. C10 ...4.775
NewBritian(10) S15 ...4.225
N.Tonawanda,N.Y.B11 3.725
Pittsburg,Calif. C11 ...4.475
Riverdale,Ill. A1 .....3.725
SanFrancisco S7 .....5.00
Seattle(25) B3 .....4.725
Seattle N14 .....4.725
Sharon,Pa. S3 .....4.225
So.Chicago,Ill. W14 ...3.725
So.SanFrancisco(25) B3 4.475
SparrowsPoint,Md. B2..3.725
Sterling,Ill. N15 .....4.725
Torrance,Calif. C11 ...4.475
Warren,O. R2 .....3.725
Weirton,W.Va. W6 ....3.825
WestLeechburgh,Pa. A4.3.975
Youngstown U5, Y1 ...3.725

STRIP, Hot-Rolled Alloy
Bridgeprt,Conn.(10)S15. 6.05
Carnegie,Pa. S18 .....6.45
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.10
Houston,Tex. S5 .....6.50
KansasCity, Mo. S5 ....6.70
Midland,Pa. C18 .....5.85
NewBritn.,Conn.(10)S15 6.05
Sharon,Pa. S3 .....6.45
Youngstown U5 .....6.10

STRIP, Cold-Rolled Carbon
Anderson,Ind.(40) G6 ..5.50
Bridgeprt,Conn.(10)S15. 5.80
Butler,Pa. A10 .....5.10
Cleveland A7, J5 .....5.10
Dearborn,Mich. D3 .....6.05
Detroit D2 .....5.60
Detroit M1 .....5.45
Dover,O.(40) G6 .....5.50
Ecorse,Mich. G5 .....5.30
Follansbee,W.Va. F4 ...5.10
Fontana,Calif. K1 ....7.00
FranklinPark,Ill.(40)T6 .5.35
Ind.Harbor,Ind. I-2 ....5.35
Lackawanna,N.Y. B2 ..5.10
LosAngeles C1 .....7.15
Mattapan,Mass. T6 ....5.95
Middletown,O. A10 ....5.10
NewBritain(10) S15 ....5.80
NewCastle,Pa. B4 .....5.80
NewCastle,Pa.(40) E5 ..5.70
New Haven,Conn. D2 ...5.85
NewHaven,Conn. A7 ...5.60
Pawtucket,R.I. R3 ....6.45
Pawtucket,R.I.(21) N8..6.30
Riverdale,Ill.(40) A1 ...5.35
Rome,N.Y. R6 .....5.10
Sharon,Pa. S3 .....5.80
SparrowsPoint,Md. B2 .5.10
Trenton,N.J. R5 .....6.45
Wallingford,Conn. W2 ..630
Warren,O.(40) T5 .....5.70
Warren,O. R2 .....5.10
Weirton,W.Va. W6 .....5.10
Youngstown C8 (40) ...5.70
Youngstown Y1 .....5.10

STRIP, Electro Galvanized
Dover,O. G6 .....5.50
Warren,O. T5 .....5.70
Weirton,W.Va. W6 ....5.10
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP
Atlanta A11 .....4.45
Riverdale,Ill. A1 .....4.30
Sharon,Pa. S3 .....4.55
Youngstown U5 .....4.15

ROPE WIRE
Alton,Ill. L1 .....9.30
Bartonville,Ill. K4 .....8.95
Buffalo W12 (43) 8.55
Fostoria,O. S1 (43) 8.85
Johnstown,Pa. B2 (43)..8.55
Monessen,Pa. P16 (43)..8.55
Monessen,Pa. P7 (43) ..8.80
Muncie,Ind. I-7 (43) ...8.75
Palmer,Mass. W12 (43)..8.85
Portsmouth,O. P12 (43).8.85
Roebling,N.J. R5 (43) ..8.85
SparrowsPt. B2 (43) ..8.65
Struthers,O. Y1 (43) ...8.55
Worcester J4, T6 (43) ..8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
AlabamaCity R2..	6.075	6.325
Aliquippa J5 ...	6.075	6.525‡
Atlanta A11	6.325	6.675
Bartonville(19)K4	6.075	6.40
Buffalo W12	5.225	....
Cleveland A7 .... 6.375		
CrawfordsvilleM8	6.175	6.475
Donora,Pa. A7 ...6.375		*6.775*
Duluth,Minn. A7 ..6.375		*6.775*
Fairfield T2 ...6.375		*6.775*
Houston,Tex S5..	6.475	6.80
Johnstown B2 ...	6.075	6.45†
Joliet,Ill. A7 ....6.375		*6.775*
KansasCy.,Mo. S5.	6.675	7.00
Kokomo C16	6.175	6.425
LosAngeles B3 ...7.025		....
Minnequa C10 ...	6.325	6.70•
Monessen P7	6.075	6.45
Palmer W12	5.525	....
Pitts.,Calif. C11 ..7.325		*7.725*
Prtsmth.(18)P12..	6.475	....
Rankin A7 ....6.375		*6.775*
So.Chicago R2 ..	6.075	6.325
So.S.Fran. C10 ..	7.025	7.40•
SparrowsPt. B2 ..	6.175	6.55†
Sterl'g(1)(48)N15	6.375	6.925
Struthers,O. Y1 ..	6.075	6.475
Worcester A7 ....6.675		*7.075*

•Based on 14c zinc; †14.50c zinc; ‡17.5c zinc.

WIRE (16 gage) Stone Stone (Add 4.7% on base and extras) — An'ld. Galv.

Aliquippa J5	10.15	12.15
Bartonville(19)K4	10.25	12.00•
Cleveland A7 ....12.00		*13.55*
Crawfrdsville M8.	10.73	12.51
Fostoria,O. S1 ..	10.40	13.00
Johnstown B2 ..	10.73	12.58§
Kokomo C16.	10.625†	12.325§
Minnequa C10..	10.40	12.425•
Palmer,Mass. W12.	10.25	12.15
Pitts.,Cal. C11 ....12.35		*13.90*
SparrowsPt. B2 .	10.84	12.68§
Sterling(1) N15	10.73†	12.15†
Waukegan A7 ....12.00		*13.55*
Worcester A7 ....12.30		*13.85*

•Based on 14c zinc; §14.50c zinc. †Includes 4.7% increase.

WIRE, Manufacturers Bright, Low Carbon
AlabamaCity,Ala. R2..5.225
Aliquippa,Pa. J5 (42)...4.85
Atlanta A11 .....5.475
Alton,Ill. L1 .....5.45
Bartonville,Ill. K4 ....5.325
Buffalo W12 .....5.225
Chicago W13 .....5.475
Cleveland A7, C20 ....5.225
Crawfordsville,Ind. M8.5.325
Donora,Pa. A7 .....5.225
Duluth,Minn. A7 .....5.225
Fairfield,Ala. T2 .....5.225
Fostoria,O. (24) S1 ...5.725
Houston S5 .....5.625
Johnstown,Pa. B2 ....5.225
Joliet,Ill. A7 .....5.225
KansasCity,Mo. S5 ....5.825
Kokomo,Ind C16 .....5.325
LosAngeles B3 .....6.175
Minnequa,Colo. C10 ...5.475
Monessen,Pa. P7 .....5.475
Newark 6-8 ga I-1 ....5.88
No.Tonawanda B11 ...5.225
Palmer,Mass. W12 ....5.525
Pittsburg,Calif. C11 ...6.175
Portsmouth,O. P12 ....5.625
Rankin,Pa. A7 .....5.225
So.Chicago,Ill. R2 ....5.225
So.SanFrancisco C10 ..6.175
SparrowsPoint,Md. B2..5.325
Sterling,Ill.(1) N15 ...5.225
Struthers,O. Y1 .....5.225
Waukegan,Ill. A7 .....5.225
Worcester,Mass. A7 ....5.525

WIRE, Cold-Rolled Flat
Anderson,Ind. G6 .....6.95
Buffalo W12 (43) 6.35
Cleveland A7 .....6.95
Crawf'sville,Ind.M8(43). 6.70
Dover,O. G6 .....6.95
Fostoria,O. S1 (43) 6.00
Kokomo,Ind. C16 (43)..5.70
FranklinPark,Ill. T6(43) 6.20
Massillon,O. R8 (43) ...5.85
Monessen,Pa. P16 (43)..6.35
Monessen,Pa. P7 (43) ..6.10
Pawtkt,R.I.(12) N8 (43)6.85
Trenton,N.J. R5 (43) ...6.15
Worcester,Mass. A7 ....7.25
Worcester,Mass. T6 (43).6.50
Worcester,Mass.W12(43) 6.65

WIRE, Galv'd ACSR for Cores
Bartonville,Ill. K4 .....8.90
Monessen,Pa. P16 (43)..8.50
Muncie,Ind. I-7 (43) ...8.70
Roebling,N.J. R5 (43) ..8.80
SparrowsPt.,Md. B2(43).8.60
Johnstown,Pa. B2 (43)..8.50

WIRE, MB Spring, High Carbon
Aliquippa,Pa. J5 (43) ..6.25
Alton,Ill. L1 .....6.75
Bartonville,Ill. K4 .....6.64
Buffalo W12 (43) 6.25
Cleveland A7 .....6.55
Donora,Pa. A7 .....6.55
Duluth,Minn. A7 .....6.55
Fostoria,O. S1 (43) 6.25
Johnstown,Pa. B2 (43)..6.25
Millbury(12) N6 (43)...8.05
Minnequa,Colo. C10(43).6.50
Monessen,Pa. P7 (43) ..6.25
Monessen,Pa P16 .....6.75
Muncie,Ind. I-7 (43) ...6.45
Palmer,Mass W12 (43) 6.55
Pittsburg,Calif. C11 ....7.50
Roebling,N.J. R5 (43)..6.55
Portsmouth,O. P12(43)..6.25
So.Chicago,Ill. R2 (43)..6.25
So.SanFran. C10 (43) 7.20
SparrowsPt.,Md. B2 (43)6.35
Struthers,O Y1 (43) ...6.25
Trenton,N.J. A7 .....6.85
Waukegan,Ill. A7 .....6.55
Worcester A7 .....6.85
Worcester, T6, W12 (43).6.55
Worcester,Mass. J4 (43).6.75

Wire Upholstery Spring
Aliquippa,Pa. J5 .....6.275
Alton,Ill. L1 .....6.50
Buffalo W12 .....6.275
Cleveland A7 .....6.275
Donora,Pa. A7 .....6.275
Duluth,Minn. A7 .....6.275
Johnstown,Pa. B2 .....6.275
LosAngeles B3 .....7.225
Minnequa,Colo. C10 ...6.525
Monessen,Pa. P7 .....6.275
Monessen,Pa. P16(42) ..6.40
NewHaven,Conn. A7 ..6.575
Palmer,Mass. W12 ....6.575
Pittsburg,Calif. C11 ..7.225
Portsmouth,O. P12 ....6.275
Roebling,N.J. R5 ....6.575
So.Chicago,Ill. R2 ....6.275
So.SanFrancisco C10 ..7.225
SparrowsPoint,Md B2..6.375
Trenton,N.J. A7 .....6.575
Waukegan,Ill. A7 .....6.275
Worcester,Mass. A7 ..6.575

WIRE, Fine & Weaving (8"Coils)
Alton,Ill. L1 (43) 9.20
Bartonville,Ill. K4 .....9.42
Buffalo W12 (43) 8.90
Chicago W13 .....9.32
Cleveland A7 .....10.05
Crawf'sville,Ind. M8(43) 8.90
Fostoria,O. S1 (43)) 8.90
Johnstown,Pa. B2 (43)..8.90
Kokomo,Ind C16 (43).8.90
Monessen,Pa. P16 (43)..8.90
Muncie,Ind. I-7 (43) ...9.10
Palmer,Mass. W12 (43).9.20
Roebling,N.J. R5 (43) ..9.20
Waukegan,Ill. A7 ....10.05
Worcester,Mass. A7 ...10.35
Worcester,Mass. T6(43).9.20

WIRE, Tire Bead
Bartonville,Ill. K4 ....11.51
Monessen,Pa. P16 (43).11.40
Roebling,N.J. R5 (43).11.55

WOVEN FENCE, 9-15½ Ga. Col.
AlabamaCity,Ala R2 ...135
Ala.City,Ala.,17-18ga.R2 222
Aliqu'pa,Pa.9-14½ga.J5 139‡
Atlanta A11 140
Bartonville,Ill.(19) K4 ..137
Crawfordsville,Ind. M8 ..138
Donora,Pa. A7 133
Duluth,Minn. A7 133
Fairfield,Ala. T2 133
Houston,Tex. S5 145
Johnstown,Pa. B2 138
Johnstown 17ga.,6" B2 .229
Joliet,Ill. A7 133
KansasCity,Mo. S5 149
Kokomo,Ind. C16 140
Minnequa,Colo. C10 ....146•
Monessen,Pa. P7 138
Pittsburg,Calif. C11 156
Rankin,Pa. A7 133
So.Chicago,Ill. R2 135
Sterling,Ill. (1) N15 136

•On 14c zinc; ‡17.5c zinc.

FENCE POSTS — Col.

ChicagoHts.,Ill. C2	140
Duluth,Minn. A7 (49)	...136
Franklin,Pa. F5	140
Huntington,W.Va. W7	145
Johnstown,Pa. B2	148
Marion,O. P11	140
Minnequa,Colo. C10	138
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

Wire, Barbed — Col.

AlabamaCity,Ala. R2	...144
Aliquippa,Pa. J5	.....148‡
Atlanta A11	149
Bartonville,Ill.(19) K4	..146
Crawfordsville,Ind M8	..147
Donora,Pa. A7	148
Duluth,Minn. A7	148
Fairfield,Ala. T2	148
Houston,Tex. S5	154
Johnstown,Pa. B2	145
Joliet,Ill. A7	148
KansasCity,Mo. S5	158
Kokomo,Ind. C16	149
Minnequa,Colo. C10	....153•
Monessen,Pa. P7	147
Pittsburg,Calif. C11	168
Rankin,Pa. A7	148
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10.	.167•
SparrowsPoint,Md. B2	..147
Sterling,Ill.(1)N15	151

•On 14c zinc; ‡17.5c zinc.

BALE TIES, Single Loop — Col.

AlabamaCity,Ala. R2	...132
Atlanta A11	135
Bartonville,Ill.(19) K4	..132
Crawfordsville,Ind. M8	..132
Donora,Pa. A7 143	
Duluth,Minn. A7 143	
Fairfield,Ala. T2 143	
Joliet,Ill. A7 143	
KansasCity,Mo. S5	144
Kokomo,Ind. C16	134
Minnequa,Colo. C10	137
Pittsburg,Calif. C11 167	
So.Chicago,Ill. R2	132
So.SanFran.,Calif. C10	..156
SparrowsPoint,Md. B2	..134
Sterling,Ill.(1) N15	143

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	...127
Aliquippa,Pa. J5	127
Atlanta A11	130
Bartonville,Ill. (19) K4.	.127
Chicago,Ill. W13	127
Cleveland A9 (44)	125
Crawfordsville,Ind. M8	..127
Donora,Pa. A7	127
Duluth,Minn A7	127
Fairfield,Ala. T2	127
Galveston.Tex. D7	135
Houston,Tex. S5	135
Johnstown,Pa. B2	127
Joliet,Ill. A7	127
KansasCity.Mo. S5	139
Kokomo,Ind. C16	129
Minnequa,Colo. C10 (44).123	
Monessen,Pa. P7	127
Pittsburg,Calif. C11	146
Portsmouth,O. P12	132
Rankin,Pa. A7	127
So.Chicago,Ill. R2	127
SparrowsPt. Md. B2	129
Sterling,Ill. (1) N15	127
Worcester,Mass. A7	133

NAILS, Cut (100 lb keg.) to dealers (33)
Conshohocken,Pa. A3 ..$7.80
Wheeling,W.Va. W10 ...7.80

STAPLES, Polished, Stock

To dealers & mfrs. (7)	C
AlabamaCity,Ala. R2	...
Aliquippa,Pa. J5	.....
Atlanta A11	.....
Bartonville,Ill. (19) K4.	..
Chicago W13	.....
Crawfordsville,Ind. M8	..
Donora,Pa. A7	.....
Duluth,Minn. A7	.....
Fairfield,Ala. T2	.....
Johnstown,Pa. B2	.....
Joliet,Ill. A7	.....
Kokomo,Ind. C16	.....
Minnequa,Colo. C10 (45) .	
Monessen,Pa. P7	.....
Pittsburg,Calif. C11	.....
Portsmouth,O. P12	.....
Rankin,Pa. A7	.....
So.Chicago,Ill. R2	.....
SparrowsPt.Md. B2	....
Sterling,Ill. (1) N15	....
Worcester,Mass. A7	....

TRACK BOLTS (20) Treated
KansasCity,Mo. S5(46) ..9
Lebanon,Pa. (31) B2...9
Minnequa,Colo. C10 9
Pittsburgh P14 9
Pittsburgh O3 10

AXLES
Ind.Harbor,Ind. S13 ...6
Johnstown,Pa. B2 5

TIE PLATES
Fairfield,Ala. T2 .....4.
Gary,Ind. U5 .....4.
Ind.Harbor,Ind. I-2 ...4.
Lackawanna,N.Y. B2...4.
Minnequa,Colo. C10 ...4.
Pittsburg,Calif. C11 ...5.
Seattle B3 .....5.
Steelton,Pa. B2 .....4.
Torrance, Calif. C11 ...5.

JOINT BARS
Bessemer,Pa. U5 .....5.
Fairfield,Ala. T2 .....5.
Ind.Harbor,Ind. I-2 ...5.
Joliet,Ill. U5 .....5.
Lackawanna,N.Y. B2 ..5.
Minnequa,Colo. C10 ...5.
Steelton,Pa. B2 .....5.

STANDARD TRACK SPIKES

	Std. No. 1	Std. No. 2	Std. Tee R All 60 No. 2	Ur
RAILS				
Bessemer,Pa. U5	4.075	3.975	4.025	
Ensley,Ala. T2	4.075	3.975	....	
Fairfield,Ala. T2	....	....	....	
Gary,Ind. U5	4.075	3.975	4.025	
Huntington,W.Va. W7	....	....	....	
IndianaHarbor,Ind. I-2	4.075	3.975	4.025	
Johnstown,Pa. B2	....	....	...(16)	
Lackflawanna,N.Y. B2	4.075	3.975	....	
Minnequa,Colo. C10	4.075	3.975	....	
Steelton,Pa. B2	4.075	3.975	....	
Williamsport,Pa. S19	....	....	....	

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.65-1.66
20.25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	2.460
18.25	4.25	1	4.75	2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025
9	3.25	0.5	....	1.01

W	Cr	V	Mo	
6.4	4.5	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

FOOTNOTES
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 & heavier
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. l
(20) 0.25c off for untreat
(21) New Haven, Conn., b
(22) Del. San Francisco l area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer t 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricat to consumers, 5.05c
(27) Bar mill sizes.
(28) Bonderized.
(29) Add $31.50 per ton.
(30) Sheared; add 0.35c universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct
(34) 7.35c for cut length
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: & narrower.
(38) 14 gage & lighter: 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035 0.035" and heavier 0.25c higher.
(41) 9.10c for cut length
(42) Plus 0.375c per 100
(43) Plus 4.7% on base extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100
(46) Plus 2.2 per cent.
(48) 6-7 gage.
(49) U-post; add 2 cols. T-post.

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3	
List Per Ft.	8.5c		11.5c		17c		23c		27.5c		37c		58.5c		76.5c							
Pounds Per Ft.	0.85		1.13		1.68		2.28		2.73		3.68		5.82		7.62							
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (††)	28.75	12.50	31.75	16.50	34.25	20	36.75	21	37.25	22	37.75	22.50	39.25	22.50	39.25	22.50						
Alton, Ill. L1 (††)	25.75	9.5	28.75	13.5	31.25	17	33.75	18.5	34.25	19	34.75	19.5	36.25	19.5	36.25	19.5						
Benwood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75						
Etna, Pa. N2 (†)	28.75	9.50	31.75	13.50	34.25	17	36.75	18.75	37.25	19.75	37.75	20.25	39.25	21	39.25	21						
Fontana, Calif. K1 (††)	15.75	0.50	18.75	3.50	21.75	7	23.75	8	24.25	9	24.75	9.5	26.25	9.5	26.25	9.5						
Ind. Harbor, Ind. Y1 (††)	27.75	11.50	30.75	15.5	33.25	19.0	35.75	20.0	36.25	21.0	36.75	21.50	38.25	21.50	38.25	21.50						
Lorain, O. N3 (*)	28.75	18.50	31.75	22.50	34.25	26	36.75	25.50	37.25	26.50	37.75	27	39.25	25.50	39.25	25.50						
Sharon, Pa. M6	32.5	16.25	35.5	20.25	38	23.75	38.5	22.75	39	23.75	39.5	24.25	40	23.25	40	23.25						
Sparrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75						
Youngstown R2 (**)	28.75	12.5	31.75	16.5	34.25	20.0	36.75	21.0	37.25	22.0	37.75	22.5	39.25	22.5	39.25	22.5						
Youngstown Y1 (††)	28.75	12.50	31.75	16.50	34.25	20.0	36.75	21.00	37.25	22.00	37.75	22.50	39.25	22.50	39.25	22.50						
Wheatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25						

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (††)	18.25	2.5	22.25	5	24.75	7.50	26.25	9	26.25	9	26.00	8.75	28.50	11.25
Ambridge, Pa. N2 (†)	18.25	..	22.25	...	24.75	....	26.25	....	26.25	....	26.00	....	28.50	....
Lorain, O. N3 (*)	18.25	7	22.25	8	24.75	10.50	26.25	12	26.25	12	26.00	11.75	28.50	14.25
Youngstown Y1 (††)	18.25	2.5	22.5	5.0	24.75	7.5	26.25	9.0	26.25	9.0	26.0	8.75	28.5	11.25

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, R2 (**)	18.25	2.5	22.25	5.0	24.75	7.5	26.25	9.0	26.25	9.0	26.0	8.75	28.5	11.25

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		92c		$1.09					
Pounds Per Ft	0.24		0.42		0.57		9.20		10.89					
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv				
Benwood, W. Va. W10	29.5	+0.25	23.25	+3.5	17.75	+7.75	33	14.25	33	14.25				
Butler, Pa. F6 (†)	28	+1.25	22	+4.75	16	+9.5	..	....	..	....				
Etna, Pa. N2 (†)	28	+1.25	22	+4.75	16	+9.50	30.25	11.50	30.25	11.50				
Sharon, Pa. M6 (‡)	29.5	—1.75	23	+2.25	18	+5.25	..	....	..	....				
Sharon, Pa. S4 (†)	28.0	1.75	22.0	+1.75	16.0	+5.0	..	....	..	....				
Sparrows Pt., Md. B2	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....				
Youngstown R2 (**)	..	..	..	..	..	..	30.25	13.00	30.25	13.00				
Wheatland, Pa. W9	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....				

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 12.50c; (**), 11.50c; (*), 5c; (**), 11c; with discounts adjusted depending on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft., inclusive.

O.D. in.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	14.80	18.05–18.96	....	....
1¼	13	17.53	21.38–22.45	16.93	....
1½	13	19.37–20.34	23.63–24.81	18.16	....
1¾	13	22.89–24.72	27.92–30.16	20.28	....
2	13	25.65–27.71	31.29–33.81	22.73	....
2¼	13	28.89–31.20	35.24–38.06	25.62	....
2½	12	31.36–33.87	38.25–41.32	28.31	....
2¾	12	34.54–37.31	42.14–45.52	31.19	....
3	12	37.40–40.39	45.62–49.28	33.77	....
3½	12	39.89–43.08	48.65–52.56	35.76	....

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	11
⅝-in. & ⅝-in.	15
¾-in. and larger	14
Longer than 6 in.:	
All diams.	8
Lag bolts, all diams.:	
6 in. and shorter	19
over 6 in. long	16
Ribbed Necked Carriage	15
Blank	30
Plow	30
Step, Elevator, Tap and Sleigh Shoe	18
Tire Bolts	8
Boiler & Fitting-Up Bolts	28

NUTS

	Reg.	Hvy.
H.P. & C.P. Square:		
½-in. & smaller	10	10
⅝-in. & ⅝-in.	8	1
¾-in.-1½-in.	4	+4
1⅝-in. & larger	22	1
H.P. Hex.:		
½-in. & smaller	12	+3
⅝-in. & ⅝-in..	8	+3
¾-in.-1½-in.	4	+3
1⅝-in. & larger	4	+3
C.P. Hex.:		
½-in. & smaller	22	18
⅝-in. & ⅝-in.	19	13
¾-in. & 1½-in.	15	8
1⅝-in. & larger	2	+4

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	33	26
⅝-in. & ⅝-in.	27	19
¾-in.-1½-in.	21	11
1⅝-in. & larger	5	list
		Light
⅛-in. & smaller	33	26
¼-in. to ⅝-in.		26
¾-in. to 1½-in.		18

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	37
1 in. and smaller diam. x over 6 in.	24

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼-in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5 & 10
Plated finishes	30 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	40
¾-in. through 1 in.	26
Longer than 6 in.:	
⅝-in. and smaller	24
¾-in. through 1 in.	2

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh; f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.50c

⅛-in. under .....40 off

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95

CARBON

35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+ % Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. N.Y., c.l., in bags	10.90
Electrolytic iron:	
Annealed, 99.5% Fe.	42.50
Unannealed (99+ % Fe)	36.50
Unannealed (99+ % Fe) (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	34.00
Antimony, 500 lb lots.	78.00
Brass, 20-ton lots.	30.00-39.00
Bronze, 10-ton lots	52.25-60.00
Copper:	
Electrolytic	43.50
Reduced	43.50
Lead	21.75
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	48.50
Silicon	38.50
Solder	8.50*
Stainless Steel, 302	87.00
Zinc, 10-ton lots.	17.50-25.00
Tungsten Melting grade, 99% 60 to 200 mesh:	Dollars
1000 lb and over	5.35
Less than 1000 lb	5.50
Chromium, electrolytic 99.9% Cr min.	3.50

* plus cost of metal.

STAINLESS STEEL

(Add 4.7% to extras where new extra cards have not been issued)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	44.25	36.50	33.75
302	44.50	39.75	34.00
303	46.50	43.50	36.50
304	46.50	41.75	35.50
309	60.50	59.25	48.25
316	61.50	63.50	53.00
321	53.00	52.00	40.00
347	58.00	56.50	44.75
410	39.00	32.75	27.50
416	40.00	40.00	28.00
420	47.00	50.25	33.50
430	41.50	33.25	28.00
501	29.25	27.75	15.25

Balt., Types 301-347 and 430 sheets, except 303 and 309 E2.

Brackenridge, Pa. sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa. sheets and strip except Types 303, 309, 416 420, 501 & 502 A10

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Harrison, N. J., wire, Type 302, 33.00c; Type 304, 34.50c; Type 316, 51.50c, including 4.7% increase.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, bars, shapes U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, strip A4.

Youngstown, strip C8.

CLAD STEELS

(Cents per pound; add 4.7% to base price and extras)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Copper Base Both Sides
302	....	....	19.75	26.24-27.50	77.00
304	25.00	29.50	24.50	27.50-27.77	77.00
309	30.50	35.00	....	....	....
310	36.50	41.00	....	....	144.00
316	29.50	34.00	26.00	35.92-36.50	....
317	34.50	39.00	....	....	....
318	33.50	38.00	....	....	....
321	26.50	31.00-32.00	23.00	33.00	111.00
347	27.50	32.00	24.00	33.50-33.83	130.00
405	21.25	27.75	....	....	....
410	20.75	27.25	....	....	....
Nickel	33.55	45.15	....	....	....
Inconel	41.23	54.18	....	....	165.00
Monel	34.93	46.28	....	....	....
Copper*	....	....	....	44.00	....

	Strip Carbon Base Cold-Rolled 10%	Strip Carbon Base Cold-Rolled Both Sides	Strip Carbon Base Hot-Rolled 10%	Strip Carbon Base Hot-Rolled Both Sides
Nickel	41.00	54.00	....	....
Copper*	23.70	26.65	20.20	26.40

* Deoxidized. Production points: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York 25 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	5.96	7.35	7.38	6.68	...	6.56	7.64	11.27	6.59	6.55	7.78
Boston	6.66	7.54	8.39	6.81	...	6.57	7.82	11.98	6.68	6.83	7.98
Buffalo	5.95	6.85	8.71	6.47	...	6.05	7.15	11.85	6.20	6.38	7.67
Birmingham	5.80	6.65	7.70[2]	5.80	...	5.80	8.62	...	5.95	6.10	8.15
Charlotte, N. C.	6.75	7.55	8.49	6.70	...	6.80	8.09	...	6.80	6.85	...
Chicago	5.95	6.82	7.75	6.10	...	5.98	7.025	11.45	6.07	6.03	7.18
Cincinnati	6.33	6.94	8.17	6.45	...	6.33	7.43	11.92	6.59	6.60	7.45
Cleveland	5.95	6.82	8.00	6.27	...	6.04	7.10	11.59	6.40	6.25	7.51
Detroit	6.22	7.02	8.04	6.39	6.85	6.27	7.32	11.57	6.54	6.55	7.52
Houston	6.89	...	8.62	7.16	...	7.13	...	...	6.94	6.86	8.24
JerseyCity,N.J.	6.54	7.45	8.72	6.82	...	6.75	7.90	11.84	6.50	6.67	8.01
Los Angeles	7.05	8.70	8.45	7.05	11.20	6.85	9.40	12.75	6.75	6.90	8.90
Milwaukee	6.12	6.99	7.92	6.27	...	6.15	7.30	11.62	6.24	6.20	7.35
Moline, Ill.	6.31	7.17	8.25	6.45	...	6.33	7.37	...	6.42	6.38	...
New York	6.54	7.45	8.72	6.82	...	6.75	7.90	11.84	6.50	6.67	8.01
Newark, N. J.	6.77	7.59	8.72	6.82	...	6.75	7.90	...	6.50	6.67	8.08
Norfolk, Va.	6.75	...	...	7.30	...	7.00	8.50	...	6.85	6.95	7.65
Philadelphia	6.30	7.25	7.89	6.70	8.30	6.57	7.66	11.59	6.30	6.30	7.37
Pittsburgh	5.95	6.82	8.30	6.20	...	5.98	7.12	11.45	6.07	6.03	7.18
Portland, Oreg.	7.80	9.05	9.30	7.50	...	7.25	9.40	...	7.25	7.05	9.25
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.73	...	6.58	6.68	7.80
St. Louis	6.25	7.12	8.05	6.40	...	6.28	7.43	11.75	6.47	6.43	7.66
St. Paul	6.47	7.48	8.56	6.77	...	6.64	7.78	...	6.73	6.69	7.92
San Francisco	7.15	8.40	9.60	7.05	...	6.85	9.40	12.75	6.75	6.90	8.90
Seattle-Tacoma	7.70	8.20	9.60	7.50	...	7.07	9.54	13.00	6.76	7.05	8.90
Spokane (city)	7.40	9.40	9.80	7.15	...	7.10	9.60	13.20	7.00	7.10	9.15
Washington	6.51	7.86	8.35	7.19	...	7.07	8.15	...	7.10	7.96	8.29

*Prices do not include gage extras; †prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [5]—1000 to 1999 lb.

Mills Boost Shipments to Warehouse

Distributors expect to attain better balance in inventories by July 1. Situation should improve further as many large users will cut demands during vacations

New York — More finished steel products are reaching warehouses as mill deliveries improve. By July 1 more inventories will be near balance. Large bars, structurals and cold-rolled sheets will be short through third quarter. July shipments to warehouses will be lighter. Alloy bar stocks are better balanced and stainless production is sufficient for the maintenance of distributors' inventories. Mechanical tubing over 1½-in. is tight. Unless the order is changed, warehouses will require ratings for the sale of nickel-bearing stainless after July 1.

Philadelphia — Warehouse business continues brisk. There may be some seasonal letup this month on a tonnage basis although it really has not begun to show itself yet. Most distributors are confident trading on a dollar basis will exceed that of all other months so far this year due to the effect of higher prices resulting from the revision in mill extras.

Inventories are still short of balance on an over-all basis. On a product basis they are quite short in hot-rolled bars and shapes, moderately so in plates and hot and cold-rolled sheets, and not short at all in most cold drawn specifications and galvanized sheets.

Cleveland—Local warehouse operators expect some slackening in demand over coming weeks as result of vacation suspensions. Full impact on order volume will be felt in the first couple weeks of July, which appears to be the most favored period for vacations.

June order volume of distributors is holding up well and some sellers say they would do even better were there stocks in such shape as to accommodate all the business offered them. Over-all stocks are up noticeably from the beginning of the year, but they are still unbalanced.

Sheets, heavy plates and bars appear in greatest stringency here. Automotive and appliance requirements continue most pressing for the flat-rolled items. Currently, warehousemen are anticipating a slight spurt in demand for repair materials to arise from the severe damage in this area suffered in last week's tornado.

Pittsburgh—Warehousemen in the district report inquiries are steady, mainly for standard material. These inquiries are not helping warehouses to build up orders, and the complaint is that receipts from mills aren't always sufficient to satisfy requirements.

One ray of hope is extended to warehousemen. They have been told they can expect some carryover material in July.

Reaction to a possible Korean peace has not fazed warehouse customers for seevral weeks. With a good backlog of orders they are inclined to worry about cutbacks when they seem more immediate.

Aside from heavy gage plates and wide flange beams, steel sheets are the toughest supply problem for warehouses. Hot and cold-rolled are not plentiful.

Cincinnati — Inventories have not improved and in the face of vacations they are not expected to get any better. Business volume is about the same. Demand is strong but in many instances supplies are inadequate.

Los Angeles—Distributors' buying is more and more being limited to rounding out gaps in inventories. Warehouses are well-stocked in structurals and bar sized shapes and are refusing allocations in rounds under ½ in. Stocks of plates and sheets are non-existent and in terrific demand by fabricators.

Seattle—Certain popular items continue in short supply at warehouses. Other products, however are plentiful. Stocks of sheets, plates and wide flange sections are insufficient to meet demands.

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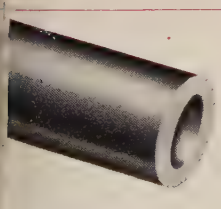

Manufacturers of ring-shaped tool steel parts who don't use Crucible Hollow Tool Steel in their operations are missing a good bet. Already, some users have cut just their material costs as much as 20% by using it in place of regular bar stock.

This hollow form of Crucible tool steel is available in three famous grades: KETOS, AIRDI 150 and SANDERSON. And it is supplied with machine finished inside and outside diameters and faces — cut to your specific length requirements.

With Crucible Hollow Tool Steel, toolmakers can now eliminate drilling, boring, cutting-off and rough facing operations. This, of course, reduces production time, increases machine capacity and cuts scrap losses.

For further information, call your nearest Crucible warehouse . . . or write for new brochure describing Crucible Hollow Tool Steel, Dept. S, Crucible Steel Company of America, Chrysler Bldg., New York 17, N. Y.

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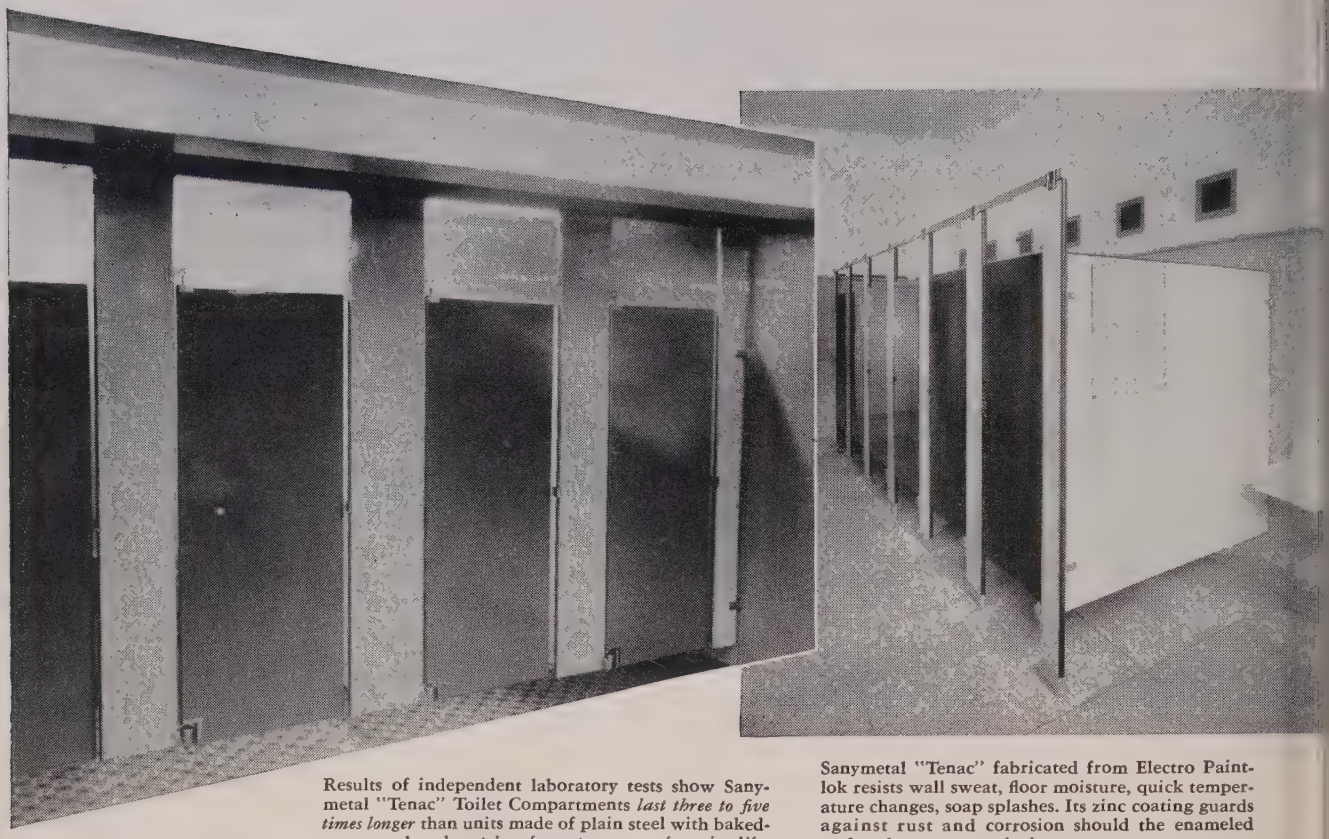

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Sanymetal "Tenac" fabricated from Electro Paintlok resists wall sweat, floor moisture, quick temperature changes, soap splashes. Its zinc coating guards against rust and corrosion should the enameled surface become scratched.

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uto Builders Pressing For Sheets

Heavy automotive requirements chief cause for tight supply of hot and cold-rolled. Fading premium prices reflect lag in galvanized demand

Sheet and Strip Prices, Page 147 & 148

Cleveland—So long as automotive mand continues at the present ac- erated pace, producers of sheets icipate no marked easing in sup- conditions. As yet no slacken- in auto requirements is seen, l while some of the pressure has ed from the appliance industries, se latter still are taking about rything offered them in the way flat-rolled.

Mills are booked solidly through rd quarter. Unless some order ncellations are received there is le chance for any open tonnage oming available until fourth quar- . The carryover from second to rd quarter will be substantial and l take up a large part of third rter production.

Adding to prospects for continued ingency is the fact some produc- n is expected to be lost over com- weeks as result of curtailments ulting from vacations.

Lending to supply uncertainty for future also is the possibility of steel strike in event present wage gotiations break down. At pres- the best guess seems to be the ge question will be settled with- a strike, but there can be no tainty of this until agreements actually signed. As of the pres- it looks as though a settlement y not come for another couple eks, possibly not before the dead- e July 1.

Meanwhile, market interest con- ues centered on probable develop- nts pricewise in event the steel- rkers win another wage boost. It thought in the trade prices will e, possibly as much as $5 per ton, uld workers be granted 10 cents hour more. This is largely spec- ation and is without any founda- n in fact since neither the union's ge demands or the steelmakers' ers, if any, have yet been made own.

The lag in galvanized sheet de- and continues. Some trade authori- s think the sluggishness reflects t only increased galvanized capac- but the slump in farmer buying wer as result of lower farm com- dity prices.

At any rate conditions have reached point where price softness on gal- nized sheets is appearing. Two

United Press

Water Preheaters

Flue gas reclaimers are swung into place at the plant being built by Freeport Sulphur Co. in Garden Island Bay, La. The reclaimers will preheat water that will be used to melt sulphur trapped far beneath the mud and water of a marsh delta

Midwest producers last week announced reductions. One now quotes No. 10 gage galvanized at $5.475 whereas it had been quoting $5.775. The second producer reduced its price on No. 10 gage from $5.475 to $5.325, and on galvannealed from $6.025 to $5.875. In both instances the new prices are still above the general run of the market, which is $5.075 on No. 10 gage.

Philadelphia — Demand for sheets for air conditoners continues extremely heavy. On a relative basis it exceeds that for any other consumer appliance manufactured in this district, although pressure is strong for most such appliances. The only exception is stoves, and even most stovemakers appear willing to accept all tonnage available.

Producers of hot and cold-rolled sheets are booked up solidly ahead as far as they care to go, which is through third quarter. Only in a few cases have they restricted limits to less and in no case to more.

This is also true of electrical sheets with heavy requirements for this grade still coming from manufacturers of small motors. This reflects continued activity in household durables, such as refrigerators, washing machines, etc.

New York — Hot and cold-rolled sheets continue in heavy demand. Were it not for substantial importations from Europe a number of sheet fabricators, including certain large ones, would have to reduce operations appreciably.

Items with any suggestion of a lag include the small sizes of hot strip, 6-in. and under, and galvanized sheets.

An interesting aspect of the galvanized situation is that most warehouses claim to have more than sufficient supply on hand, while producers say they have no particular difficulty moving their output into consuming channels.

Another somewhat mixed aspect involves reports of large consumers arranging for certain conversion deals in the fourth quarter, while some eastern steel companies that have been supplying conversion steel report a noticeable letup in pressure on them from certain customers for such tonnage.

Cincinnati—Sheet and strip production in this area hit near record levels last week. One mill is producing 2000 more ingot tons a week this year compared to last year when production averaged a little more than 29,000 tons weekly. All of the electric furnaces of the Middletown Division, Armco Steel Corp., were shut down last week and will remain out this week for repairs. This will reduce production of stainless and mild steel grades.

Chicago—Automobile builders are pressing sheetmakers as hard as ever for the largest possible tonnage of cold-rolled and hot-rolled sheets. This condition will continue even should car production turn down because once a balanced condition in steel supply-demand starts developing it will be the premium tonnage that is dropped first.

Los Angels—Kaiser Steel Corp.'s order books, now closed, reduced fabricators' allocations in thrid quarter to cut arrearages. Fourth-quarter rolling schedules will be opened July 1. Sheet and plate are in tightest supply of any of the steel products.

San Francisco—Hot and cold-rolled sheet supply remains critical, but supply of galvanized sheets appears adequate. Mills are under orders from the government through June on production quotas for certain items, hence the reason for the continued relatively heavy "run" on flat-rolled items.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 146

Los Angeles—Despite high level engineering construction activity, fabricators report tonnages per job average 25 tons compared with 100-300 tons last year. Supplies of reinforcing material are ample.

Seattle—Rolling mills are operating at capacity on comfortable order backlogs but the market is becoming more keenly competitive. It is expected the largest tonnage pending, 34,000 tons of reinforcing for The Dalles dam, Columbia river, will be distributed among coast mills. Potential demand continues strong.

Steel Bars . . .

Bar Prices, Page 146

Boston—Alloy bars are booked beyond carbon bar grades even by producers booking on a monthly basis with lead-times unchanged. Also alloy shipments are improving with deliveries nearer schedule this month. Decontrol of molybdenum is helping those grades, broadening the range of specifications and more users going back to normal production tonnage. June melting sheets reflect this in molybdenum alloys.

Stainless bar output permits distributors and consumers to maintain inventories with some prices based on freight equalization. Equalizing sales are also appearing on bolts and nuts. The latter shops are not pressing so hard for bar tonage. Textile mill equipment shops, among leading bar users normally, are not ordering heavily and are concerned only as to odd sizes in hot and cold-rolled carbon rounds, 17/32 and 19/32-in.

Generally bars over 1½-in. are in limited supply due to military requirements. Pantex Mfg. Co., Pawtucket, R. I. has a supplemental shell contract.

New York—Hot-rolled carbon steel bars still hold at close to the top in point of consumer pressure, and so long as the automotive industry continues to maintain its schedules and shell work remains active, it is believed there will be little easing in delivery promises. Hot carbon bar producers are already anticipating a substantial carryover into fourth quarter.

Philadelphia—Cold bar drawers are booked well into October on carbon grades and into September on alloy specifications.

There are more cancellations and they appear to be coming mainly from warehouses whose stocks of this material seem to be fast approaching normal. But these gaps are being filled without difficulty.

Actually, cold drawers say their major problem still is in obtaining an adequate diversity of specifications from the hot mills.

Rochester Iron & Metal Co., Rochester, N. Y., is high bidder on 8700 net tons of 5 and 6-in. billets and on 1800 tons of 5½-in. rounds at Girard Point held here by the local Ordnance District. The bid on each lot is $60.78.

Boston Metals Co., Baltimore, is high on a third lot of 5400 tons of rounds, 1 to 2⅜-in., this being SAE 1060 steel.

The steel, totaling 15,865 net tons, was rolled originally by Republic Steel Corp. for France. It has been lying on the ground here for at least two years.

Pittsburgh—Users of smaller diameter steel bars report a better flow of material into their plants. At the same time, producers admit that for the past week or 10 days, customers have not been pushing for fulfillment of their orders. Heavy military load is anticipated for third quarter but there is definite evidence of a decrease in anxiety as to deliveries among non-military customers.

Cleveland—With no sign of a tapering off in automotive demand, barmakers are looking for high level activity to continue right through the remainder of the year. Military requirements are expected to continue to provide a strong support to t market even though the shooting w in Korea ends. Any slackening automotive requirements, howev will result in some easing of supp conditions. Indications now are carryover from second to third qu ter will be substantial.

Cincinnati—There has been prac cally no change in the market p ture here for carbon and alloy ba

San Francisco—A slightly eas market situation is reported in c bon steel bars here.

Conversion Steel . .

Chicago — The shape of things come in steel supply may be devel ing now in the conversion mark Consumers, principally automo manufacturers who have been m ing generous use of all premium t nage for an extended period, n are displaying caution in regard fourth quarter commitments and t want earliest possible delivery on t nage contracted for in third quar

There has been considerable int est in conversion steel for the Oc ber-December quarter. But it is early to tell which way the w is going to blow.

Reason that users are pressing fast delivery of conversion tonna already ordered is that purchasing partments can look pretty silly sho shipments of such roll in when n

(*Please turn to page* 156)

Finished Steel Growth Outpaces That of Ingots

New York—Ability to produce finished steel products has nearly doubled the past three decades, a substantially more rapid growth than in ingot capacity which increased 78 per cent, according to the American Iron & Steel Institute.

Much of the progress centers around higher yields from ingots resulting from installation of continuous mills which replaced hand mills. The nearly doubling of effective capacity to produce steel products took place mainly in plates, sheets and similar flat-rolled items.

Hand mills were the only equipment for rolling sheets and tin plate in the early 'twenties, but in the following two decades these mills were almost entirely superseded by continuous mills. This resulted in less of the ingot going into scrap and gave greater flexibility to the mills.

Along with the sweeping change in rolling processes go new developments in furnace operation, cleaning and plating.

If the current volume of prod tion of flat-rolled products had b attempted at hand mill yields, least 27 million tons of additio ingot capacity a year, above the c rent capacity, would be needed the industry, in the opinion of prominent sheet mill executive.

In other words, steel compan would have had to expand steelm ing furnace capacity by about million tons since 1923, instead the 51.9 million tons expansion actu ly achieved in the period. On Jan 1953 capacity was 117.5 million t

From a little over 3 million t of sheets annually in the ea 'twenties, all on hand mills, this pr uct has climbed swiftly to over million tons a year. This seven-f multiplication, exclusive of enorm growth in strip and tin plate, is tw the rate of growth in unit output the automotive industry.

Most of the 1264 hand mills in in 1926 have been scrapped and h dreds of millions of dollars inve in continuous mills.

For factory floors that will not chip . . .
For skid-proof walks where feet won't slip . . .
On all machines that you equip . . .
For floors complete or center strip . . .
Use safe, long-lasting MULTIGRIP!

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U·S·S Multigrip Floor Plate has the strength to carry heavy loads. Used structurally, or for covering concrete or wooden floors, it provides a safe, permanent shield for the floor . . . reduces maintenance costs. Multigrip lends itself readily to forming, bending, or even the most complicated fabrication. And regardless of the way the plate is laid, it provides maximum skid resistance in all directions. The flat-topped risers are comfortable underfoot . . . tend to lessen fatigue. For safety's sake use Multigrip Floor Plate wherever sure footing is essential.

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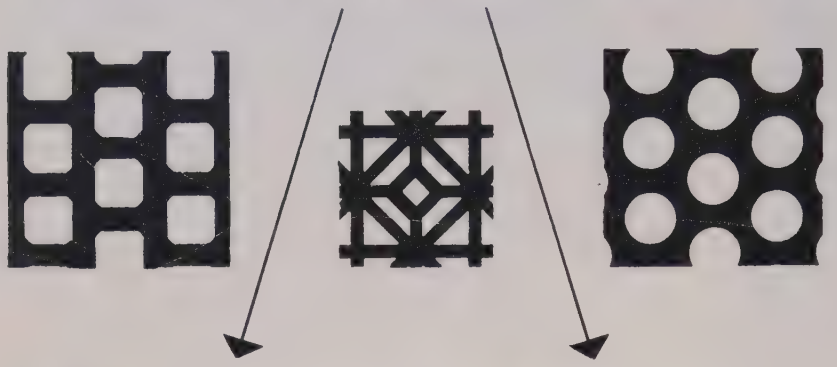

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Available in any desired shape or size of perforations, rugged Hendrick Perforated Plate can also be supplied in any gauge of high carbon, stainless steel and many other commercially rolled metals for a specific screening application.

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Choose Champion and insure complete satisfaction on every application.
Detailed bulletin regarding YOUR specific problems on request. Send for it.
THE CHAMPION RIVET CO.
CLEVELAND, OHIO • East Chicago, Ind.

(*Continued from page* 154)

tonnage can be had freely. Thus, the quicker the cleanup of conversion tonnage the less embarrassment is likely to arise.

Plates . . .

Plate Prices, Page 146

New York—Eastern plate producers anticipate high level activity in the third and fourth quarters. Certain mills, booking on a month-to-month basis, have not yet opened books beyond August but there is no question they could fill up their schedules on sheared and universal plate through September without difficulty, even for a month or so beyond if they were so disposed.

Alloy plate is definitely less active than it was, with shipments available in August. In some specialties, notably floor plate, still earlier shipments can be had.

Philadelphia — While demand for carbon plate is strong, an easing in alloy plate is noted with shipments available in August. Clad plates also are in fairly easy supply, and floor plate can be had without difficulty.

Sheared and universal carbon plate deliveries are well extended through out third quarter. Those mills that have opened their books for the entire 3-month period have filled their schedules. Those who haven't opened books to that extent are turning away tonnage.

Pittsburgh—Producers agree that current production of plates is disappointing. Military placements are still strong for heavier gage plates and mills expect a good demand from this source through third quarter. There will be greater emphasis on quality.

Chicago—Plate fabricators are receiving steady and substantial shipments from plate mills but tonnage falls consideraly below requirements. This is causing delay of several months in fabricators fulfilling their contracts since it had not been expected that steel stringency would remain severe so long.

Incoming shipments of plates go into fabrication immediately since it has not been possible to establish anything resembling working inventories.

Seattle—About 1200 tons of plates, also a large tonnage of reinforcing, are involved in a tank project at Hanford Works, bids June 10. Several small tank jobs for municipalities in Oregon and Washington are pending. Early award of 9000 tons for tanks at the General Petroleum Corp.'s refinery at Ferndale, Wash., is expected. Two other proposed refinery projects in western Washington

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HERE'S a compact (8½" x 11"), but really powerful Dings Electromagnet that takes the manpower out of lifting heavy iron or steel.

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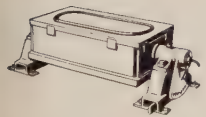

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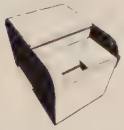

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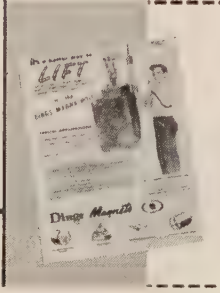

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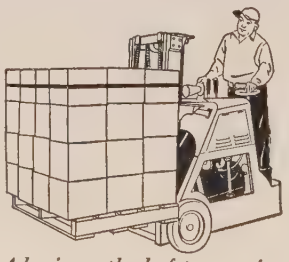

A basic method of preventing accidents to pallet loads in intra-plant handling.

Steel SIGNODE Strapping

SEND FOR FOLDER SHOWING 6 BASIC WAYS OF UNITIZING

involve major plate tonnages. Small shops are adversely affected by material shortages.

Semifinished Steel . . .

Semifinished Prices, Page 146

Pittsburgh — The Pittsburgh district's ingot rate is currently reflecting the difficulty of a major district producer to get back into full swing when it was necessary to change crews, and revamp the company's production schedule, following some changes in the open-hearth production picture.

Forging billets are enjoying a good demand. Users are reporting a shorter waiting time, however, for semifinished. Opinion across the board seems to be to ride along with the increase in extras but a definite policy to avoid them, wherever possible, is apparent.

Youngstown — Steelmaking operations here are estimated for this week at 105 per cent of capacity. Three bessemers, 70 open hearths and 23 blast furnaces are on the active list. A year ago Youngstown steel plants were 100 per cent idle because of labor trouble.

Los Angeles—Production at western steel plants is reaching new peaks. Bethlehem Pacific Coast Steel Corp. produced 87,265 tons of ingots in May, 116 per cent of rated ingot capacity and highest in history. Kaiser Steel Corp.'s Fontana Works open hearths are pouring ingots at 123.5 per cent of theoretical capacity.

San Francisco—Production of steel ingots at the South San Francisco plant of Bethlehem Pacific Coast Steel Corp. reached 27,420 tons in May, topping the previous all-time peak set in March by 1149 tons. Including the Los Angeles and Seattle plants, production was 87,265 tons, as against theoretical capacity of 75,000 tons and the previous record of 86,384 established in March.

Wire . . .

Wire Prices, Page 148

Pittsburgh—Some increase in demand is reported in merchant wire products, but the bulk of business is still in manufacturers wire items. Most of the gain in merchant products is resulting from seasonal orders for agricultural items.

Chicago — All manufacturers wire items are holding strong in demand with balance between production and consuming needs not yet in sight.

Merchant products present quite a different picture. In these there has been slack for some time. However, May shipments increased over those

...with TYCOL lubricants on hand!

eavy-duty cutting operations? Here's what happens when you switch to Tycol Afton oils! A well-known Engineering Company (you'd recognize the name instantly) recently tested cutting oils used to shape 14″ gears on a Gleason Bevel Gear Generator. Their findings: after the first rough cut around, with competitive oils, they had to grind a full ⅛″ off the cutter. With Tycol Afton 8, they hobbed *two* gears and took off only .013″. Afton oils are non-corrosive . . . and so stable they're widely recommended as hydraulic oils! They serve a triple function as coolants, lubricants, and hydraulic media on the same machine . . . the heavier the cut — the better they perform. It will pay you to find out why — by ontacting your local Tide Water office!

Over 300 Tycol industrial lubricants are at your disposal . . . engineered to fit the job!

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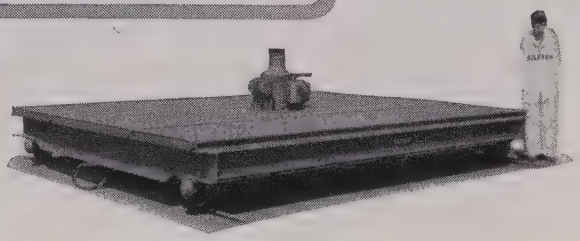

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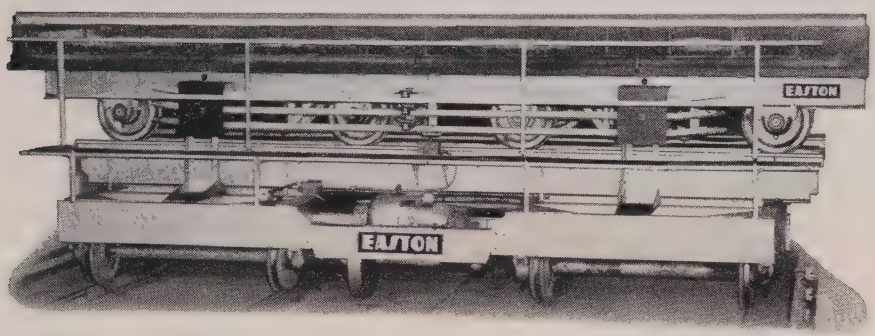

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You can be *sure* of the best ball and roller bearing lubricant when you use NON-FLUID OIL because specific grades are available to withstand high speeds, heavy loads or the violent shocks of all kinds of operating conditions.

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in April, and June tonnage seems c tain to run ahead of that in May.

Baling wire continues to lag a probably will do so until early f Because of last year's drought it estimated that perhaps half of 1 purchases was carried over.

San Francisco—Pickup in dema for manufacturers' wire is noticea here but merchant wire and na continue to lag.

Structural Shapes . .

Structural Shape Prices, Page 146

Philadelphia — Structural activi still is being bolstered principally bridge work, and at present th is less of that coming out for b than a month ago.

The largest commercial project prospect here is an office buildi to be erected on a block bounded Fifteenth, Sixteenth and Market S and Pennsylvania boulevard, the fi structure in the Penn Center dev opment.

Issuance of plans is still some ti off. The structure will be built a owned by Uris Bros., New York.

Boston — Structural fabricati shops are not passing on high extra costs entirely in scatte cases, although backlogs would w rant a firm stand in this directi District shops are still competiti One Somerville, Mass., shop boo an 1850-ton contract for a New Y state thruway. Individual proje are more numerous, but total t nage being estimated is below l year, notably for bridges, appro mating 1500 tons.

Industrial expansion is over t hill, but orders include about 12 tons, tube mill, Bridgeport Brass C

Shops are less willing to pay p miums, but one high priced produc is sold through July. Larger sho experience difficulty in procuri plates to meet girder backlogs.

New York — Apart from brid work, structural demand is spott However, fabricators generally ha substantial backlogs in relation their capacities, and still compla of difficulty in obtaining sufficie diversity of shapes to keep them g ing at top level.

Pittsburgh—Producers' order boo are pretty well filled up through t third quarter. No push seems a parent on the part of fabricat who might be ordering in anticip tion of a possible price increa after steel wage negotiations a settled. Demand at present see to come from warehouses, fabric tors, carbuilders, all of whom ha

(*Please Turn to Page* 165)

"National security is impossible without financial security of individual citizens..."

FRED MAYTAG
The Maytag Company

"Ingenious research and the ability to produce . . . which have helped to make the United States the world's greatest nation . . . could not have been realized without the savings of millions of thrifty persons. Savings of individuals financed new inventions, developed others. The Payroll Savings Plan for purchasing Savings Bonds regularly provides an easier way for American workers to save for future spending or investment, for their own security, and for their nation's security. Our experience at the Maytag Company has shown us that a successful Payroll Savings program can be the foundation and the cornerstone of happy employee relations."

Let's point up Mr. Maytag's concise summary of the Payroll Savings Plan with a few very recent figures:

• at the close of February, 1953, the *cash value* of Series E Bonds held by *individuals* reached a new high: $35.5 billion. This is $1 billion more than the value of the Bonds held on May 1, 1951, when E Bonds began to mature.

• to this encouraging reservoir of future purchasing power, 8,000,000 Payroll Savers are adding $160,000,000 per month by their consistent investment in U.S. Savings Bonds.

• unit sales of E Bonds in 1952 reached the highest level of the past six years—more than 77 million individual pieces. Of the 77 million units, 67 million were in the $25 and $50 denominations—the bonds bought chiefly by Payroll Savers.

• Payroll Savers are serious savers—of the approximately $6 billion Series E Bonds which had become due up to the end of March, $4.5 billion, or 75%, were retained by their owners beyond maturity.

If you are not among the 45,000 companies that make the benefits of the Payroll Savings Plan available to their employees . . . or if you do have a Plan and your employee participation is less than 50%, a telegram or letter to Savings Bond Division, U.S. Treasury Department, Washington Building, Washington, D. C., will bring you all the information and assistance needed to build a *good* Payroll Savings Plan.

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Columbia alloy bars have muscle—and plenty of it. It's the kind of uniform strength that our many customers have learned to rely on, because each alloy bar is made to the same exacting standards as the last.

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MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $85, Palmerton, Pa.; $85, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $225 per gross ton of alloy, c.l. packed $237; gross ton lots, packed, $252; less gross ton lots, packed $260; f.o.b. Alloy, Wa. Va., Niagara Falls, N. Y., Ashtabula, Philo or Marietta, O., Lynchburg, Va. Base price: $226, Anaconda, Mont. (Mn 74-76%, C 7% approx.) Base price per net ton $200, Etna, Johnston and Sheridan, Pa.

Shipment from Pacific Coast warehouses by the seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $267; less gross ton lots, $284, f.o.b. Chicago. Add or subtract $2.80 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn. carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 7.5% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P. 0.06% max). Add 0.5c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 30c; ton lots, 32c; 50 to 1999 lb, 34c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 4.5% max. Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 3% max. Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High - Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr., c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr. 67-72%) Contract, carload, lump, bulk, max. 0.03% C 37.60c per lb contained Cr, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. 8 M x D, bulk, 26.25c per lb of contained Cr. C.l., packed 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr. 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max.) 25.75c per lb of contained silicon plus 16.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract carload, 1" x D; packed, max 0.50% ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c; prices on 0.10 per cent carbon grade, C grade, $1.12 per lb of contained chromium. up 4c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si. c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l lump bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c Freight allowed. Spot add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c. freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 10,000 lb W or more, $4.35 per lb of contained W; 2000 lb W to 10,000 lb W, $4.45; less than 2000 lb W, $4.57, f.o.b. Niagara Falls, N. Y.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packed 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered, Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add O.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max) Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx. Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13. f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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This completely new trolley conveyer, designed to meet the requirements of the most discriminating buyer, is the result of five years of intensive development by Mathews Engineers. The top-quality precision wheel, with hardened races, is the heart of this rugged newcomer to the fine 4" trolley conveyer field. For the overhead conveying job that demands stamina and exceptional performance, we believe the No. 4207 Loadstar is without equal anywhere.

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San Carlos, California
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Mathews Conveyer Company, Ltd., Port Hope, Ont.

ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in Italic.

ORES

Lake Superior Iron Ore

(Prices effective for ore delivered up to and including June 30, 1953; gross ton, 51.50% iron natural, rail or vessel, lower lake ports.)

Old range bessemer	$10.10
Old range nonbessemer	9.95
Mesabi bessemer	9.85
Mesabi nonbessemer	9.70
Open-hearth lump	10.95
High phosphorus	9.70

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect on Dec. 31, 1952, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematites (spot)	24.00-26.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$55.00
Domestic scheelite, mine	63.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.21 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 90-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom. $32

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $99.30; Salina, Pa., $104.55; Niles, O., $109; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $99.30; Hays, Pa., $105.10; Niles, O., $107; E. Chicago, Ind., Joliet, Rockdale, Ill., $109.70; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $179.55; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $69.30; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $92.40; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $127; Johnstown, Pa., $127.30; Clearfield, Pa., $135; St. Louis, $138; Athens, Tex., $140.90.

Nozzles

Reesdale, Pa., $203.20; Johnstown, Pa., $208.40; Clearfield, Pa., $219.45; St. Louis, $224.65; Athens, Tex., $225.20.

Runners

Reesdale, Pa., $158.20; Johnstown, Pa., $161.70; Clearfield, Pa., $168.60; St. Louis, $170.30; Athens, Tex., $174.40.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $166.30; Danville, Ill., $169.30.
60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $210.20; Danville, Ill., $213.20.
70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $244.85; Danville, Ill., $247.85; Clearfield, Pa., $252.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connelsville, foundry	16.50-17.00
New River foundry	20.80
Wise county foundry	15.95
Wise county, furnace	15.20

Oven Foundry Coke

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.00
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	26.58
LoneStar,Tex. ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
St. Paul, ovens	**23.75**
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44-45
Birmingham area	$49.50

Cents per pound, ovens

Phenol, 40 (carlots, nonreturnable drums)	17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38.

Imported, net ton, duty paid, metallurgical grade, $35-$36.

tructural Shapes . . .

(*Continued from Page* 160)

nall inventories. Some increase in lectivity is reported among buyers structurals.

Seattle—Fabricators are getting in- full operation after the six weeks' rike shutdown. Largest award last eek, 1600 tons, went to Isaacson on Works, Seattle, for an Army ower plant addition at Elmendorf ield, Alaska. Several major con- acts, totaling 15,000 tons, mostly ublic works, are expected to be laced soon. Backlogs are substan- al. Continued scarcity of wide ange sections and plates handicaps abricators.

ome Steel Orders Cancelled

San Francisco—Steel mills in this rea are receiving some cancella- ions of orders as customers become more inventory conscious. However, demand continues intense and opera- ions are moving along at a clip gen- rally commensurate with any period n the recent past.

Effects of the last year's steel trike have faded completely. Where order cancellations have been re- eived, the mills have diverted the onnage to other customers. In some ases there has been a doubling up of shipments.

Tubular Goods . . .

Tubular Goods Prices, Page 149

Pittsburgh — Strong market pre- vails for large diameter seamless tubes, mainly because of the current acute shortage of plates for large pipe fabrication. Standard buttweld pipe books for fourth quarter will open July 1.

First weakness is expected in butt- weld demand, probably showing up late in third quarter. Some lessen- ing in demand for seamless is re- ported, especially in the small to medium sizes.

Producers of oil country goods are currently watching the trend to high- er interest rates. An increase may cause some projects to be delayed.

Beaver Falls, Pa.—To reflect re- cent changes in prices on carbon steel strip and to give effect to the recovery of cost increases not per- missible in past price changes, the Tubular Products Division, Babcock & Wilcox Co. revised prices on electric resistant welded condenser, heat exchanger and mechanical tub- ing made from hot-rolled and cold- rolled strip, effective June 3. The price changes cover electric resistant

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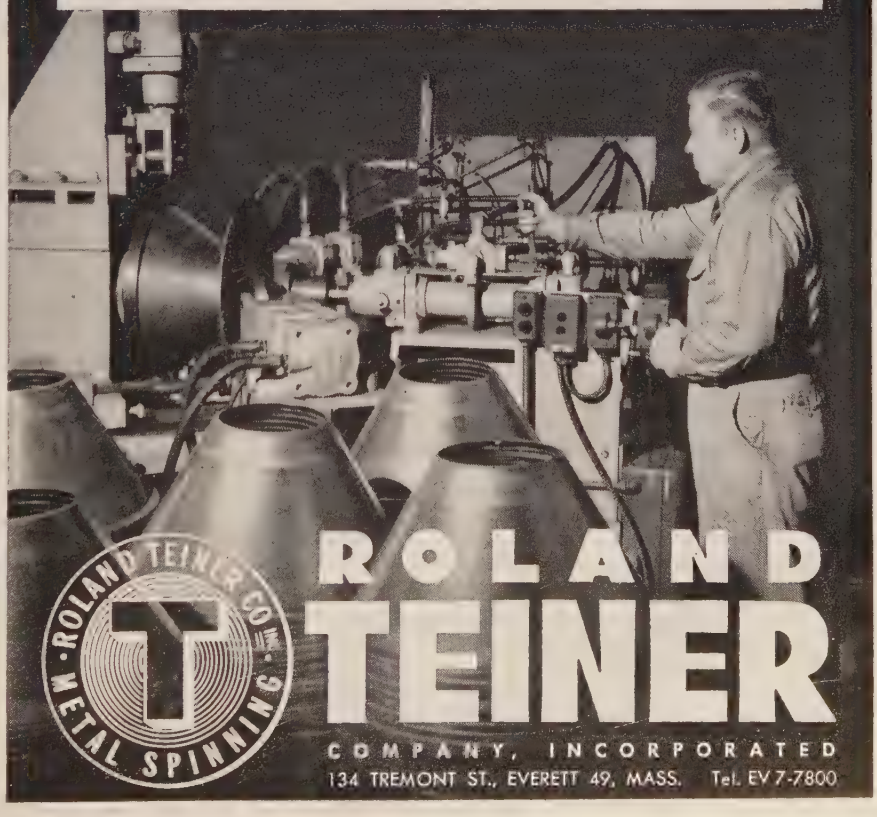

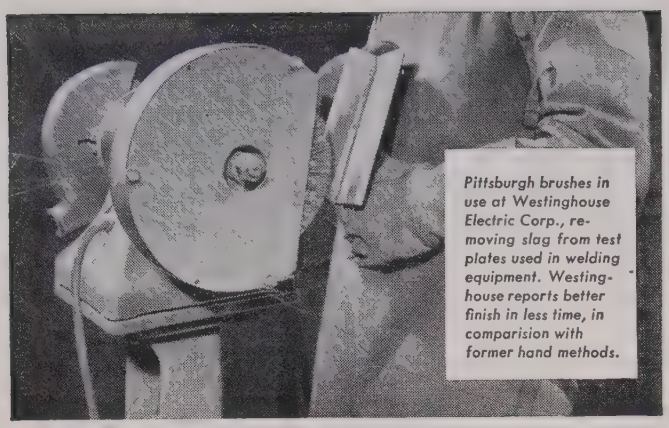

Pittsburgh brushes in use at Westinghouse Electric Corp., removing slag from test plates used in welding equipment. Westinghouse reports better finish in less time, in comparision with former hand methods.

Replace hand finishing with power-driven Pittsburgh Brushes for

Better Cleaning Lower Labor Costs Fewer Rejects

—as these companies did:

Removal of imbedded slag in welding test plates formerly was done by hand at the Westinghouse Electric Corp., Trafford, Pa., using a wire brush and welder's hammer. Pittsburgh brushes, powered by a direct-drive ½ h.p. motor, now remove more slag in less time, and produce a better finish. In addition, Westinghouse reports their Pittsburgh brushes "stand up better than average in use."

Complete cleaning of dried concrete, rust and scale from steel frames used in concrete forming is essential prior to re-using the forms. Pittsburgh wire brushes were installed at the Universal Form Clamp Co., Chicago. Working on a conveyor-fed machine, the Pittsburgh brushes now remove all foreign material at a rate of 50 pieces per hour, replacing former laborious hand brushing and scraping.

De-scaling preheated bar stock at the Dominion Forge & Stamping Co., Ltd., Canada, was formerly done by hand scraping. This never did a complete job, and inclusions resulted which produced defective forgings. Pittsburgh brushes, on specially-designed machines, now do the job, and have "increased efficiency, decreased the amount of scrap, improved work quality, and saved labor."

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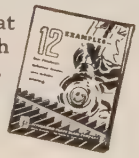

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welded condenser, heat exchanger and mechanical tubes produced at Alliance, O.

San Francisco—Pipe up through 4 inches in diameter is not too difficult to obtain, but this cannot be said of the larger sizes.

Seattle—Several fair-sized cast iron pipe jobs are pending including 350 tons, 10-in., at Friday Harbor, Wash., bids in. About 1000 tons in Oregon and Washington openings are unplaced. Fairbanks, Alaska, is asking bids on an unstated tonnage of steel pipe. U. S. Engineers also have a steel pipe job at the Great Falls, Mont., air base.

Pig Iron . . .

Pig Iron Prices, Page 142

Cleveland — Indications are the foundries in this area will generally close for vacations, full effect of the closings coming in the first week of July. As a result, demand pressure on merchant iron sellers is expected to ease noticeably with the foundries disinclined to stock appreciably with supply conditions in their favor. Slower period of demand is expected to extend beyond the July 4th holiday.

For all practical purposes supply-demand balance prevails in the pig iron market. However, so far as can be determined there is no noticeable piling of iron by the furnaces for lack of orders. While the foundries are specifying cautiously and in line with their actual requirements, overall demand is such as to take up all the tonnage produced though sellers are forced to solicit business more actively than has been the case for a long time past.

The shortage of silvery iron resulting from the extended shutdown of blast furnaces by a strike at Jackson, O., will not clear away for some time. Though the strike ended more than a week ago, one of the stacks will not get back into production until a rebuilding job is completed.

Youngstown—No. 4 blast furnace at Youngstown Sheet & Tube Co.'s Campbell Works has been blown out for relining. The furnace, a 1300 ton stack, will be idle for about three weeks. One other furnace in this area is idle. That is Pittsburgh Coke & Chemical Co.'s Struthers stack which was shut down several weeks ago.

New York—Pig iron inquiry is fairly steady, although a drop will likely come shortly as a reflection of restricted schedules due to vacations. The movement during the first two weeks of July should be particularly slow.

Little foreign iron is coming in here, due primarily to the fact requirements are mainly for foundry grades of which there is ample domestic supply.

Cincinnati—The Jackson, O., strike involving the silvery pig iron suppliers to this area ended a week ago. Jackson Iron & Steel Co., will not get into production for about 3 months, however, as it is in the process of rebuilding its plant. Globe Iron Co., will go into immediate production but it will take at least 30 days before reduced amounts of silvery pig iron reach all of its customers.

Malleable and gray iron auto foundries are running 6 days a week with 8-hour plus days. Work for them has been scheduled past Labor Day. A 4-day work period seems to be popular with a number of jobbing foundries that are finding work slack at the moment.

Buffalo—Pig iron production rebounded six points to 94 per cent of capacity as a leading producer of merchant iron relighted its fourth blast furnace which had been down for relining. Sellers report no difficulty finding outlets for current production. Decided improvement is noted in the railroad car situation.

Philadelhpia — Foundry iron is in adequate supply with some furnaces piling tonnage. Basic iron supply continues tight, but importations are helping out.

One stack of the Alan Wood Steel Co. at Swedeland, Pa., is due to go down this summer for relining. The Brooke furnace at Birdsboro, Pa., also is scheduled to go down this fall for the same reason.

Iron foundry operations have picked up some over the past two or three weeks. This improvement, however, is expected to be shortlived for the reason a number of shops will be closing down for mass vacations early in July.

Los Angeles — Kaiser Steel Corp., Fontana, increased its supply of hot-metal by 438,000 tons yearly, when a third blast furnace was blown in as part of a $65 million facilities expansion program.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 164

Cleveland—With the approach of the vacation season oven foundry coke sellers are beginning to feel a letup in demand. With relatively sluggish foundry operations still the rule and coke supplies adequate, there is little inclination on the part of the foundries to stockpile heavily.

Expectations are between now and the first week or so of July ordering will fall off, mass vacations beginning

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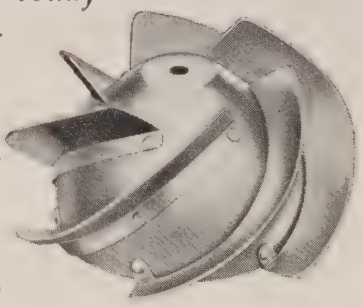

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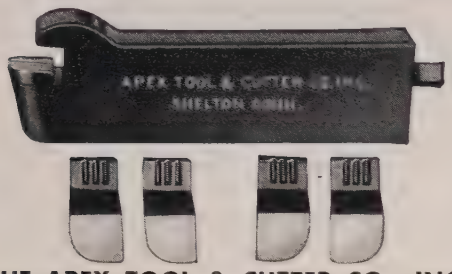

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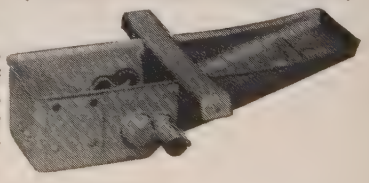

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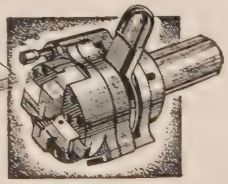

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ly $1 under prevailing quotations. about July 1. Ordering will be resumed, it is anticipated, a week or two before the vacation period ends, which means right after the July 4th holiday.

Scrap . . .

Scrap Prices, Page 170

Pittsburgh—While stories are circulating about better scrap prices being in the offing, scrap men will tell you that these are rumors aimed at getting the market started. Mills are still not marching in great number to the scrap dealers' doors.

Some of the larger steel producers are not showing much interest in scrap for the immediate future. They have re-entered the market on a limited basis, merely taking material they had refused to take until now.

No. 2 bundles are reported selling at a slightly higher price. Cast iron grades head the list of unwanted items. Railroad grades are generally selling about $1 over a week ago but this is matched by a $1 drop in prices of borings and turnings.

Cleveland—Although consuming demand continues extremely sluggish the scrap market appears to have hit bottom. Currently it is showing faint signs of returning strength. This latter is largely a reflection of trade sentiment based on the idea prices fell too low in the recent downturn and the belief that steady depletion of mill stocks will shortly force them to re-enter the market on a big scale.

For the present, at least, prices are unchanged, and no change, either up or down, is in immediate prospect.

Actually, brokers and dealers do not anticipate much activity until the present steel wage negotiations are out of the way. They feel that once it is certain there will be no steel strike the mills are likely to come out with some large orders. Buying of such nature would put a strong prop under the scrap market but no one in the trade thinks prices will rise as fast or as far as they recently went down.

New York—Steel scrap brokers report no particular pressure from the mills. They are confident, however, that consumers are continuing to eat into their backlogs and that a more lively inquiry may develop at any time. Meanwhile, brokers' buying prices are virtually unchanged throughout the list.

Buffalo—Recent weakness and indications of lower prices in the scrap market here were squelched last week as a leading mill consumer placed new orders for steelmaking grades within the prevailing price ranges. Blast furnace items are quoted a shade higher. Machine shop turnings were not included in the new orders.

Stronger markets in other areas and outside inquiries in the local market are bullish factors. Water receipts continue heavy, especially from the eastern seaboard.

Philadelphia—For the third consecutive week scrap prices have held virtually unchanged. This applies to all the major steel and cast grades. Incoming shipments at scrap yards are shrinking but apart from this consideration there appears to be no indication of an early upturn.

Detroit—The scrap steel market is slightly stronger with No. 1 heavy melting now quoted $33 to $34, and No. 2 heavy melting, No. 1 bundles, No. 2 bundles, and busheling all up $1 per ton. Other grades are unchanged pricewise.

The little sign of strength that has developed here is due primarily to broker competition rather than the placing of new orders by consumers. The over-all market, however, does appear firmer and it looks as though it may have hit bottom and is leveling off for the time being.

Cincinnati—There are indications the scrap market is getting a little stronger. Demand is somewhat heavier. Open-hearth grades remain unchanged. Buyers are not showing enough interest to move cast prices one way or the other. Situation is mixed in borings and turnings with machine shop turnings and short shovel turnings down $1 a ton while mixed borings and turnings and cast iron borings are up $1.

Chicago—The scrap market here is showing a bit of new strength but pricewise the effect is limited mostly to blast furnace grades and the gain is only $1 to $2 a ton. Trading in these grades isn't heavy but in the recent general price decline it is probable that turnings and borings slipped off too much.

Volume of incoming scrap isn't as heavy as recently making it more difficult for brokers to fill contract commitments. Meanwhile, consumption holds steady and close to the all-time peak as steelmaking operations hold at 105 per cent of capacity or better.

St. Louis—The steel scrap market perked up last week as the district's biggest consumer bought a substantial tonnage of No. 2 melting steel and No. 1 and No. 2 bundles for the first time in two months. Railroad offerings also began moving a trifle better.

Steel purchases were reported at $34 and No. 1 bundles at $32, rough-

(*Please Turn to Page* 172)

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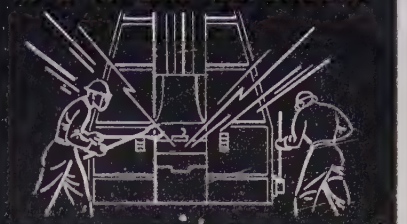

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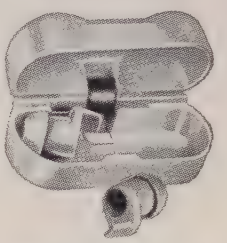

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

June 11	$39.50
June 4	39.50
May avg.	39.17
June 1952	42.63
June 1948	40.67

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting...	39.00-40.00
No. 2 heavy melting...	34.00-35.00
No. 1 bundles	39.00-40.00
No. 2 bundles	31.00-32.00
No. 1 busheling	39.00-40.00
Machine shop turnings.	*24.00-25.00*
Mixed borings, turnings.	*24.00-25.00*
Short shovel turnings..	30.00-31.00
Cast iron borings	29.00-30.00
Cut structurals	*47.00-48.00*
Heavy turnings	39.00-40.00
Punchings & plate scrap	47.00-48.00
Electric furnace bundles	44.00-45.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	40.00-41.00
Heavy breakable cast..	37.00-38.00
Unstripped motor blocks	35.00-36.00
No. 1 machinery cast..	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt..	*46.00-47.00*
Rails, 2-ft. and under..	*51.00-52.00*
Rails, 18-in. and under.	51.00-52.00
Rails, random lengths..	47.00-48.00
Railroad specialties	*51.00-52.00*

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting..	39.00
No. 2 heavy melting..	34.00-34.50
No. 1 bundles	39.00-40.00
No. 2 bundles	32.00-33.00
No. 1 busheling	38.00-39.00
Machine shop turnings	22.00-23.00
Mixed borings, turnings	26.00-27.00
Short shovel turnings..	26.00-27.00
Cast iron borings	26.00-27.00
Low phos.	43.00-44.00
Alloy free, short shovel turnings	30.00-31.00
Electric furnace bundles	41.00-42.00

Cast Iron Grades

No. 1 cupola	43.50-44.00
Charging box cast	42.00-43.00
Stove plate	42.00-43.00
Heavy breakable cast..	37.00-38.00
Unstripped motor blocks	27.00-28.00
Brake shoes	36.00-37.00
Clean auto cast	45.00-46.00
No. 1 wheels	40.00-41.00
Burnt cast	35.00-36.00
Drop broken machinery	43.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00
R.R. Malleable	49.00-50.00
Rails, 3-ft. and under	52.00-53.00
Rails, 18-in. and under	55.00-56.00
Rails, random lengths.	48.00-49.00
Cast steel	49.00-50.00
Railroad specialties	50.00-51.00
Uncut tires	49.00-50.00
Angles, splice bars	52.00-53.00
Rails, rerolling	53.00-54.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting..	41.00-42.00
No. 2 heavy melting..	34.00-35.00
No. 1 bundles	41.00-42.00
No. 2 bundles	33.00-34.00
Machine shop turnings.	22.00-23.00
Short shovel turnings..	27.00-28.00
Cast iron borings	27.00-28.00
Low phos.	47.00-48.00
Electric furnace bundles	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting...	41.00-42.00
No. 2 heavy melting...	37.00-38.00
No. 1 bundles	41.00-42.00
No. 2 bundles	Nominal
No. 1 busheling	41.00-42.00
Machine shop turnings.	27.00-28.00
Mixed borings, turnings	32.00
Short shovel turnings..	33.00
Structurals & Plate....	45.00-46.00
Heavy turnings	39.50-40.50
Couplers, springs, wheels	50.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	40.00
Heavy breakable cast..	43.00
Unstripped motor blocks	29.00
Drop broken machinery	47.00-48.00

NEW YORK

(Brokers' Buying Prices)

No. 1 heavy melting...	33.00-34.00
No. 2 heavy melting...	29.00-30.00
No. 2 bundles	Nominal
Machine shop turnings.	17.00-19.00
Mixed borings, short turnings	22.00-23.00
Low phos. (structural & plate)	37.00-38.00
Shovel turnings	22.50-23.50

Cast Iron Grades

No. 1 cupola	33.00-34.00
Unstripped motor blocks	22.50-23.00

DETROIT

No. 1 heavy melting	*33.00-34.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	*37.00-38.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*36.50-37.50*
Machine shop turnings.	14.00-15.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings..	18.00-19.00
Punchings & plate scrap	40.00-41.00

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	35.00-36.00
Stove plate	35.00-36.00
Heavy breakable	29.00-30.00
Unstripped motor blocks	30.00
Clean auto cast	42.00-43.00
Malleable	44.00

CINCINNATI

(Delivered consumer plant)

No. 1 heavy melting...	41.00
No. 2 heavy melting...	37.00
No. 1 bundles	41.00
No. 2 bundles	34.00
No. 1 busheling	41.00
Machine shop turnings..	*21.00*
Mixed borings, turnings.	*23.00**
Short shovel turnings...	*25.00**
Cast iron borings	*23.00**

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	38.00
Stove plate	28.00*
Burnt cast	28.00*
Heavy breakable cast..	37.00*
Unstripped motor blocks	30.00
Brake shoes	29.00*
Clean auto cast	38.00
Drop broken machinery	48.00

Railroad Scrap

No. 1 R.R. heavy melt.	42.00
Malleable	45.00
Rails, 18-in. and under	53.00
Rails, random lengths..	45.00

*F.o.b. shipping point.

CHICAGO

No. 1 heavy melting..	37.00-38.00
No. 2 heavy melting..	34.00-35.00
No. 1 factory bundles..	*40.00-41.00*
No. 1 dealer bundles....	*37.00-38.00*
No. 2 bundles	31.00-32.00
No. 1 busheling	37.00-38.00
Machine shop turnings .	*20.00-21.00*
Mixed borings, turnings	*20.00-21.00*
Short shovel turnings...	*-22.00-23.00*
Cast iron borings	*20.00-21.00*
Cut structurals	40.00-42.00
Punchings & plate scrap	*41.00-42.00*
Electric furnace bundles	40.00-42.00

Cast Iron Grades

No. 1 cupola	37.00-39.00
Stove plate	32.00-34.00
Unstripped motor blocks	35.00-37.00
Clean auto cast	40.00-42.00
Drop broken machinery	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt	40.00-41.00
R.R. Malleable	39.00-41.00
Rails, 2-ft. and under	49.00-50.00
Rails, 18-in. and under	51.00-52.00
Angles, splice bars	45.00-47.00
Rails, rerolling	47.00-48.00

BIRMINGHAM

No. 1 heavy melting...	29.50-30.50
No. 2 heavy melting ...	27.00-28.00
No. 1 bundles	29.50-30.50
No. 2 bundles	25.00-26.00
Machine shop turnings.	20.75-21.75
Short shovel turnings..	22.75-23.75
Cast Iron borings	22.75-23.75
Cut structurals	39.00-40.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	38.00-39.00
Charging box cast	30.00-31.00
Stove plate	34.00-35.00
Heavy breakable cast..	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
Rails, 2-ft. and under.	45.00-46.00
Rails, random lengths.	42.00-43.00
Angles, splice bars	45.00-46.00
Rails, rerolling	45.00-46.00

ST. LOUIS

(Brokers' Buying Prices)

No. 1 heavy melting...	35.00-36.00
No. 2 heavy melting...	33.00-34.00
No. 1 bundles	*34.00*
No. 2 bundles	*31.00-32.00*
Machine shop turnings..	*17.00-18.00*
Short shovel turnings..	20.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	33.00-34.00
Heavy breakable cast..	33.00-34.00
Unstripped motor blocks	33.00-34.00
Brake shoes	41.00
Clean auto cast	44.00
Burnt cast	*33.00-34.00*

Railroad Scrap

Malleable	36.00
Rails, 18-in. and under	53.00-54.00
Rails, random lengths.	39.00-40.00
Uncut tires	44.00
Angles, splice bars	45.00-46.00
Rails, rerolling	*48.00-49.00*

BUFFALO

No. 1 heavy melting...	40.50-41.00
No. 2 heavy melting...	38.00-38.50
No. 2 bundles	36.00-36.50
No. 1 bundles	40.50-41.00
No. 2 busheling	40.50-41.00
Machine shop turnings.	23.50-24.00
Mixed borings, turnings.	*29.00-29.50*
Short shovel turnings..	29.50-30.50
Cast iron borings	*29.00-29.50*
Low phos.	44.50-45.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	38.00-38.50
No. 1 machinery	42.00-43.00

Railroad Scrap

Rails, random lengths.	45.75-46.75
Rails, 2 ft. and under.	51.75-52.75

BOSTON

(Brokers' Buying Prices; f.o.b. shipping points)

No. 1 heavy melting...	30.00-31.00
No. 2 heavy melting...	25.00-26.00
No. 1 bundles	33.00-34.00
No. 2 bundles	24.00-25.00
Machine shop turnings.	17.00-17.50
Mixed borings, turnings	19.00-20.00
Short shovel turnings..	21.00-21.50
No. 1 cast	32.00-34.00
Mixed cupola cast	26.00-28.00
No. 1 machinery cast..	40.00-42.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	*31.00*
No. 2 heavy melting	*27.00*
No. 1 bundles	*30.00*
No. 2 bundles	*24.00*
No. 3 bundles	*20.00*
Machine shop turnings.	15.00
Mixed borings, turnings	15.00
Short shovel turnings..	15.00
Electric furnace, No. 1..	*33.00*

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	40.00
Heavy breakable cast..	36.00-38.00
Unstripped motor blocks	29.00
No. 1 wheels	38.00-40.00

Railroad Scrap

Rails, random lengths.	38.00

SAN FRANCISCO

No. 1 heavy melting....	28.00
No. 2 heavy melting....	24.00
No. 1 bundles	25.00
No. 2 bundles	22.00
No. 1 busheling	28.00
Machine shop turnings.	10.00
Mixed borings, turnings	29.00
Short shovel turnings..	29.00
Cast iron borings	29.00
Cut structurals	38.00
Heavy turnings	34.00
Punchings & plate scrap	37.50
Electric furnace bundles	37.00

Cast Iron Grades

No. 1 cupola	*39.00*
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast..	45.00
Unstripped motor blocks	41.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00
Malleable	55.00
Rails, 3-ft, and under.	42.00
Rails, 18-in. and under.	45.00
Rails, random lengths.	39.00
Cast steel	40.00
Uncut tires	39.00
Angles, splice bars	42.00
Rails, rerolling	44.00

LOS ANGELES

No. 1 heavy melting	*24.00*
No. 2 heavy melting...	20.00
No. 1 bundles	*24.00*
No. 2 bundles	20.00
Machine shop turnings..	*8.00*

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	40.00-43.00

HAMILTON, ONT.

(Delivered Prices)

Heavy melting	*$32.50*
No. 1 bundles	*32.50*
No. 2 bundles	*32.50*
Mechanical bundles	*28.50*
Mixed steel scrap	*28.50*
Mixed borings, turnings.	*26.50*
Rails, remelting	*32.50*
Rails, rerolling	*41.50*
Busheling	*26.50*
Busheling new factory:	
Prep'd	*30.50*
Unprep'd	*28.50*
Short steel turnings	*26.50*

Cast Iron Grades

No. 1 machinery cast..	50.00

† F.o.b., shipping point.

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	SEATTLE, WASH.	

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Scrap . . .

(*Continued from Page* 169)

Some were placed in East St. Louis, Ill., at 75 cents lower. Dealer yard receipts continue to decline, estimated at 50 to 60 per cent under the volume of two months ago.

Los Angeles—Price on steelmaking scrap continue to decline as new mill-posted schedules set the price of No. 1 heavy melting at $24, $4 off, No. 1 bundles at $24, $1 off, and machine shop turnings $2 off at $8. Kaiser Steel Corp. is out of the market on all grades. Collections of remote scrap have ceased.

San Francisco—Decline of $1 a ton in the price of No. 1 cupola cast to $39 delivered features the scrap iron and steel market. Demand for cast grades slackened in advance of the annual two weeks vacation of the foundries. Steel grades continue in good supply despite the new, lower price levels established two weeks ago. Dealers are not holding back shipments in the hope of better prices. In fact, the tone of the market indicates the bottom has not yet been reached.

Seattle—Both steel and cast grades of scrap are in ample supply. Some large buyers are out of the market, particularly for cast. Inventories are high.

No. 1 heavy melting is quoted at $31 f.o.b., No. 2 at $27, electric furnace scrap at $38, and No. 1 cupola at $40. Latest sales at Puget Sound Navy Yard, which produces about 600 tons of high grade scrap monthly, were reported at $29.09 unprepared, and $32 prepared.

Exporters are hoping for licenses to ship overseas but government agencies are said to be unresponsive. One report here is to the effect an export permit was recently granted a California interest for an unstated tonnage of foreign fabricated steel that remains unsold in the domestic market and is to be shipped overseas as scrap.

Toronto, Ont.—Steel scrap prices in Canada have been slashed $3 per ton across the board due to a leading Hamilton mill cutting its offering price to $32.50 for heavy melting and compressed bundles. This is the second month in a row that borings and turning have been reduced bringing the current price to $26.50 per gross ton. No change has been made in cast scrap still quoted at $50 gross ton delivered Hamilton.

For June, steel mills are declining to accept delivery of heavy melting scrap and for the future it is intimated that buyers will be restricted with regard to specifications.

The Secondary Metals Association says increasing withdrawal of the steel mills from the scrap market over past few months has created a paradoxical situation. Most mills are heavily stocked and dealers' yards also are well supplied. The open winter and big withdrawals from the rural districts are largely credited for the present surplus situation. Basic steel production in Canada is at an all time record pace with strong demand prevailing for finished steel.

Ferroalloys . . .

Ferroalloy Prices, Page 163

New York—Bethlehem Steel Co., Bethlehem, Pa., and E. J. Lavino & Co., Philadelphia, have followed the lead of U. S. Steel Corp. in the adoption of new specifications for standard ferromanganese.

These companies are now quoting on a basis of 74-76 per cent, and are asking 10 cents per pound of alloy, with premiums or penalties of one-tenth of a cent per pound for each 1 per cent of manganese above or below base. Base prices are equivalent to $200 per net ton f.o.b. furnace.

Another leading producer is expected to make an announcement momentarily as to what it proposes to do.

Iron Ore . . .

Iron Ore Prices, Page 164

New York—The first 60,000 tons of Peruvian iron ore for the Fairless Works, U. S. Steel Corp., at Morrisville, Pa., is being received against a contract calling for delivery of 1 million tons within a year.

The ore is being supplied by the Marcona Mining Co., a subsidiary of the Utah Construction Co., San Francisco, and is said to have a metallic iron content of more than 60 per cent.

Six ships, each with a cargo of 10,000 tons, have been loaded for the Fairless Works since late April. The ships are coming into Philadelphia where half the cargo is being transferred for rail shipment to Morrisville, the remainder being taken up by ship under light draft.

The current movement of Peruvian ore is regarded as a stopgap pending regular shipments from U. S. Steel's Venezuelan mines.

Recently iron production was started at the Hazel furnace, the second of two blast furnaces at the Fairless Works.

Cleveland — Iron ore shipments from the head of the lakes in the week ended June 8 totaled 3,079,10[illegible] gross tons, exceeding by more tha[illegible] 1 million tons shipments in the lik[illegible] week of last year. The Great Lake[illegible] ore fleet to date in the 1953 seaso[illegible] has brought down 25,547,621 ton[illegible] compared with 21,083,910 tons in th[illegible] like period of the 1952 lake shipp[illegible] ping season. At the present ship[illegible] ping rate, the projected 1953 shipp[illegible] ment goal of 100 million tons wi[illegible] be surpassed.

Canton, O.—A cargo of Bomi Hi[illegible] iron ore, destined for the Timke[illegible] Roller Bearing Co., this city, [illegible] scheduled to dock in Baltimore th[illegible] end of this month. Purchased fro[illegible] the Liberian Mining Corp., the 10[illegible] 000-ton shipment is comprised of hig[illegible] grade ore containing 67 per cent iro[illegible] and it represents one year's supp[illegible] for the Timken company. A Timke[illegible] official states Liberian ore is low[illegible] in price and be claims it is superio[illegible] in quality.

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Help Wanted

FOUNDRY METALLURGIST required with e[illegible] perience in cast iron foundry practice. Prepar[illegible] to travel. State age, experience, and salary r[illegible] quired. Write Box 750, STEEL, Penton Bld[illegible] Cleveland 13, Ohio.

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Positions Wanted

PLANT MANAGER—15 years' experience, wa[illegible] to buy part interest or control in small ma[illegible] facturing plant. Write Box 754, STEEL, Pen[illegible] Bldg., Cleveland 13, Ohio.

PLANT MANAGER—PRODUCTION MANAGE[illegible] Thoroughly familiar with practically all pha[illegible] of modern manufacturing. Twenty years' e[illegible] perience in the manufacture of diversified pro[illegible] ucts. Reply Box 747, STEEL, Penton Bld[illegible] Cleveland 13, Ohio.

SALES ENGINEERING—Familiar with Kans[illegible] Missouri area through background in warehou[illegible] selling of ferrous and non-ferrous metals, i[illegible] cluding aluminum to aircraft industry. Met[illegible] lurgy training plus thirteen years' experienc[illegible] Age 39, married with family. Reply Box 7[illegible] STEEL, Penton Bldg., Cleveland 13, Ohio.

PLANT MANAGER—15 years' experience i[illegible] Plant Management, Production Control, Accou[illegible] ing Problems, Manufacturing Development, e[illegible] Could invest. Small manufacturing plant p[illegible] ferred. Age 45, married, family. Write B[illegible] 738, STEEL, Penton Bldg., Cleveland 13, OH[illegible]

GENERAL MANAGER
14 years' warehouse experience, administrati[illegible] sales, purchasing, age 39. Metallurgical ba[illegible] ground. Prefer Cleveland Area. Reply Box 7[illegible] STEEL, Penton Bldg., Cleveland 13, Ohio.

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And Further Information write
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USED **AS IS** **RECONDITIONED**

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Box, Steel Sheathed, 40-Ton Capacity
Box, Double Sheathed, 50-Ton Capacity
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Flat, 50-Ton, Steel Underframe, 40'6" Long
Gondolas, Composite, or All Steel 50-Ton and 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Ore Hoppers, All-Steel, 50-Ton, Heavy Duty
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled

Hoppers, All-Steel, 70-ton, Triple Hopper Cross Dump

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40 & 50-Ton Capacity, Length 70' and 74'
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300 H.P., 70-Ton, Type 0-4-4-0
NEW AND RELAYING RAIL

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ALL METALS
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Machine Screw Corp.
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Makers of H & G Die Heads

FOR SALE

(3) 25 Ton HENRY & WRIGHT DIELNG PRESSES 1½" Strokes—With Double Roll Feeds. One with Scrap Cutter.
BLISS HIGH PROD. PRESSES
#630 45 Ton and #650 75 Ton 1" Strokes With Double Roll Feed & Scrap Cutters. LATE TYPE.
(Send for list of other Presses & Metal Working Mach.)
SEABOARD STEEL CO., New Haven, Conn.

SALES ENGINEER

Experienced salesman with engineering background, familiar with mechanical power drives, to represent a well established Detroit universal joint manufacturer. Would contact present customers and solicit new accounts, working out of Detroit headquarters.

Excellent earnings opportunity. Replies held in strict confidence. Give qualifications, references, extent of experience, etc. Reply Box 749, STEEL, Penton Bldg., Cleveland 13, Ohio.

IF YOU HAVE CAPACITY OPEN,

why not line up sub-contract work through an advertisement in this section? For additional information or rates, write STEEL, Penton Bldg., Cleveland 13, O.

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Warehouse Stocks of
STANDARD • MERCHANT
LAP WELD • SEAMLESS
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PITTSBURGH 30, PA. NEW YORK 7, N.Y.

PLANT MANAGER for STRUCTURAL STEEL FABRICATING PLANT

A-A-A-1 company wants experienced Plant Manager to take charge of structural steel fabricating plant. Plant has 2500-3000 ton monthly capacity. Located in Midwest. Applicant must be completely familiar with all phases of structural steel fabrication for heavy bridges and building fabrication. This is a once-in-a-lifetime opportunity for the right person who possesses necessary experience, executive ability, and technical knowledge. Write full details, including age, education, and experience. Salary open.

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Penton Bldg., Cleveland 13, Ohio

EXPERIENCED STEEL MEN WANTED

- **CHIEF METALLURGIST**
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Apply by letter stating complete qualifications and salary expected. All communications will be held in strictest confidence. Address inquiries to:

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A fast-growing steel producing company is expanding its organization. We are interested in long-term development of facilities, and to help carry out program will require young, aggressive

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Give full details of experience and salary expectation. Replies will be held in strict confidence. Box 744, STEEL, Penton Bldg., Cleveland 13, Ohio.

Portable

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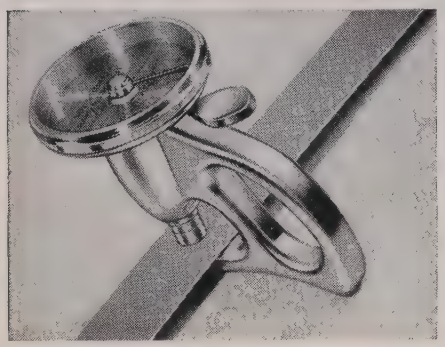
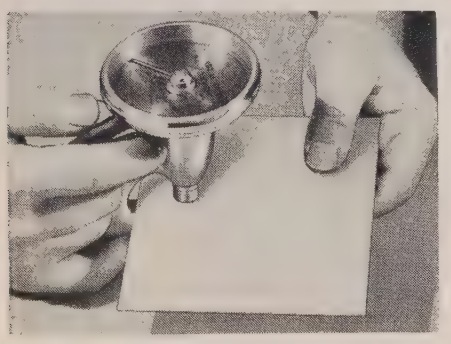


for Calipering thicknesses to ½"

for on-the-spot calipering of sheet or bar stock. Designed to fit the hand; light weight, moderately priced. Horizontal glass covered dial gives direct reading without computation. Meets ASTM requirements. Special spherical end or special anvils can be made to order.



Graduated in 1/1000ths of an inch

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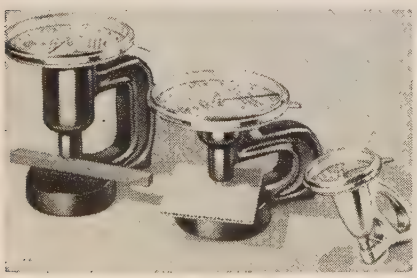
Also available in desk or laboratory sizes graduated 1/1000ths or .005."



Write for complete information and prices

E. J. Cady & Company

Manufacturers

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River Forest, Illinois

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2400 tons, maintenance hangar, Charleston, S. C., to American Bridge Division, U. S. Steel Corp., Pittsburgh; J. A. Jones Construction Co., Charlotte, N. C., general contractor.

1800 tons, thread mill, Coats & Clark, Inc., Toccoa, Ga., to Ingalls Iron Works, Birmingham; Daniel Construction Co., Greenville, S. C., general contractor.

1600 tons, power plant project, Elmendorf Air Base, Alaska, to Isaacson Iron Works, Seattle; Patti-McDonald Co., general contractor.

1000 tons or more, structurals and bars, electronics building, naval shipyard, Charleston, S. C., to B. L. Montague Co., Charleston (structurals) and Virginia Steel Co., Charlotte, N. C. (bars); R. P. Farnsworth & Co. Inc., New Orleans, general contractor.

1000 tons or more, structurals and bars, maintenance and operations hangar, naval air station, Memphis, Tenn., to Decatur Iron & Steel Co., Decatur, Ala. (structurals) and Joseph H. Fox & Co., Birmingham (bars); R. P. Farnsworth & Co. Inc., New Orleans, general contractor.

750 tons, switching and transformer structures, Shawnee and Colbert steam plants, Tennessee Valley Authority, to Lehigh Structural Steel Co., Allentown, Pa.

725 tons, coal handling facilities, Colbert steam plant, Tennessee Valley Authority, to Converse Bridge & Steel Co., Chattanooga, Tenn.

550 tons, steel towers, Shawnee steam plant, Tennessee Valley Authority, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

355 tons, police administration and court building, Hartford, Conn., to City Iron Works, Hartford; Southern New England Construction Co., Hartford, general contractor.

350 tons, manufacturing building, Brown & Williamson Tobacco Co., Louisville, Ky., to International Steel Co., Evansville, Ind.; Struck Construction Co., Louisville, general contractor.

225 tons, hangar, Shaw Air Force Base, Sumter, S. C., to Calvert Iron Works, Atlanta, Ga.; Ivey Bros. Construction Co., Atlanta, general contractor.

200 tons, gravel plant for Glacier Gravel Co., Steilacoom, Wash., to Pacific Car & Foundry Co., Seattle.

107 tons, state highway underspan, Snohomish county, and lumber plant craneway, Hoquiam, Wash., to Isaacson Iron Works, Seattle.

STRUCTURAL STEEL PENDING

2600 tons, galvanized steel transmission towers, Tennessee Valley Authority, Chattanooga, Tenn.; bids in, three contracts, June 9 and 10.

1500 tons, state bridge work, Bucks county, Pennsylvania; bids July 17.

640 tons, two-span rolled beam bridge and four-span continuous rolled beam structure, Windsor-Hartford, Conn.; Brunalli Construction Co., Southington, Conn., general contractor; also 305 deformed steel bars required.

600 tons, junior and senior high school, Syracuse, N. Y., bids June 16.

450 tons, Donnell Building, New York Public Library, W. 53rd St., New York, bids June 25.

415 tons, three bridges, Schuylkill Expressway, Philadelphia; Conduit & Foundation Co., Philadelphia, low on general contract.

185 tons, three-span continuous steel deck girder bridge, Concord-Boscawen, N. H.; bids in June 12, Concord, N. H.

175 tons, Washington state girder bridges, Lewis county; bids to Olympia, Wash., June 23.

100 tons, 4-steel frame buildings, Seattle aircraft tank testing facilities; John H. Sellen Construction Co., Seattle, low $293,018, to Boeing Aircraft Co.

REINFORCING BARS . . .

REINFORCING BARS PLACED

5000 tons, Corps of Engineers, San Francisco, to Judson Steel Corp., Emeryville, Calif.

480 tons, waterfront improvement, Ketchikan, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Birch-Lytle-Green, general contractors.

500 tons, maintenance hangar, Charleston, S. C., to Owen Steel Co., Charleston; J. A. Jones Construction Co., Charlotte, S. C., general contractor.

400 tons, highway and bridge, two contracts, South and North Kingston, R. I., to Plantations Steel Co., Providence, R. I.; S. & M. Construction Co., Providence, general contractor.

800 tons, thread mill, Coats & Clark, Inc., Toccoa, Ga., to Connors Steel Co., Birmingham, Ala.; Daniel Construction Co., Greenville, S. C., general contractor.

270 tons, sand and gravel plant, Steilacoom, Wash., to James D. English Steel Co., Tacoma, Wash.

150 tons, factory building, Brown & Williamson Tobacco Co., Louisville, Ky., to American Builders Supply Co., Louisville; Struck Construction Co., Louisville, general contractor.

150 tons, hangar, Shaw Air Force Base, Sumter, S. C., to Owen Steel Co., Columbia, S. C.; Ivey Bros. Construction Co., Atlanta, general contractor.

140 tons, addition to heat and power plant, Eielson Air Field, Alaska, and grain elevator, Wilbur, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, school building, Fairfield, Conn., to Leake & Nelson Co., Bridgeport, Conn.; George L. Hickey, Inc., Stamford, Conn., general contractor.

100 tons, including Washington state highway project, to Northwest Steel Rolling Mills, Inc., Seattle.

REINFORCING BARS PENDING

665 tons, sheet piling, Corps of Engineers, Buffalo; bids in.

440 tons, state bridge work, Bucks county, Pennsylvania; bids July 17.

400 tons, Fairchild Field hangar, Spokane, Wash.; bids in.

335 tons, Washington state road projects, bids to Olympia, Wash., June 23.

280 tons, also gates, etc., West canal, Columbia Basin project; bids to Bureau of Reclamation, about June 19.

155 tons, East low canal, Columbia Basin project; bids in.

Unstated, laboratory building, capitol group, 3-story; C. B. Lauch, Boise, Ida., low $687,480 to Board of Control, Helena, Mont.

Unstated, 185-foot state bridge, Petroleum county; bids to Highway Commission, Helena, Mont., June 17.

Unstated, disposal tanks, Hanford Works; bids to Atomic Energy Commission, June 10.

PLATES . . .

PLATES PENDING

1200 tons, disposal tanks, Hanford Works, bids to Atomic Energy Commission, Richland, June 10.

130 tons, rebids, fuel tanks, air base, Great Falls, Mont.; bids in June 5.

PIPE . . .

CAST IRON PIPE PENDING

350 tons, 10 in. mains; bids to Friday Harbor, Wash., June 8.

Unstated, water system, Ft. Richardson, Alaska; bids June 16.

STEEL PIPE PENDING

Unstated, 3265 ft., 14 and 12 in. welded, pump fittings, etc., bids June 19 to Einar Tonseth, clerk, Fairbanks, Alaska.

Unstated, 4700 ft. 4 in., Gore Field, Mont.; bids in to U. S. Engineer, Seattle.

RAILS, CARS . . .

LOCOMOTIVES PENDING

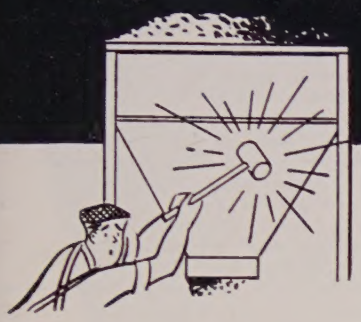
Pennsylvania railroad, 78 diesel units for road and yard freight switching service; purchase authorized.

RAILROAD CARS PLACED

Chicago, Burlington & Quincy, 30 seventy-ton covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Southern railroad, 320 seventy-ton covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

BIN STUCK LATELY?



Don't ruin your bins with a heavy hammer. Just use a CLEVELAND vibrator to eliminate arching, bridging or sticking conditions. Many successful installations on bins, hoppers, chutes of all sizes and shapes.

Air cushioned quiet types and standard metallic impact vibrators.

Save with air!

CATALOGS AVAILABLE, OF COURSE.

THE CLEVELAND VIBRATOR COMPANY

2780 Clinton Ave. • Cleveland 13, Ohio

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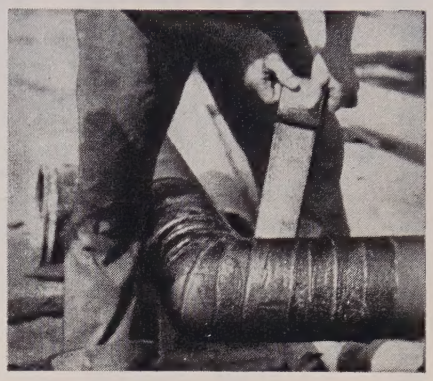
TO COMBAT CORROSION

Specify TAPECOAT®

...the Original Coal Tar Tape Protection for Pipe, Pipe Joints, Couplings and Tanks



TAPECOAT is a coal tar coating with a tar-saturated, close-woven fabric as a carrier for easy application, providing a *natural* protection against corrosion.

TAPECOAT serves as both bond and protection...requires no foreign adhesive.

TAPECOAT resists moisture, acids, alkalis, soil stress, electrolysis, chemical fumes, fly ash, salt water, salt-laden air, barnacles and other severe corrosive and abrasive conditions.

TAPECOAT is clean to handle and easy to apply by spiral or "cigarette" wrapping with the use of a torch to bleed the coating for a bond to the surface. It cuts maintenance and replacement costs.

SIZED TO THE JOB

TAPECOAT comes in rolls of 2", 3", 4", 6", 18" and 24" widths to meet varying requirements.

TAPECOAT has proved its dependability for gas and oil companies, railroads, telephone companies, air lines, ship builders and operators, water and sewage works, chemical and industrial plants, engineers and contractors... In combating corrosion both underground and above ground.

PROVED IN SERVICE SINCE 1941

Write for descriptive brochure and prices

The TAPECOAT Company

Originators of Coal Tar Tape Protection

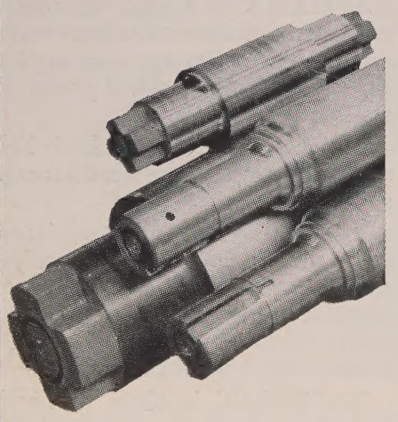
1543 Lyons Street, Evanston, Illinois

Hyde Park

RED CIRCLE Rolls ALLOY-CHILLED

Red Circle Rolls for all Purposes

Hyde Park Red Circle Rolls are outstanding in quality and in performance and are easily identified by the Red Circle.



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finer finish
long life
greater tonnage
Specify Red Circle

Chilled Rolls
Alloy Iron Rolls
Moly Rolls
Nickel Chilled Rolls
Grain Rolls
Cold Rolls
Sand Rolls

Hyde Park

FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.

ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

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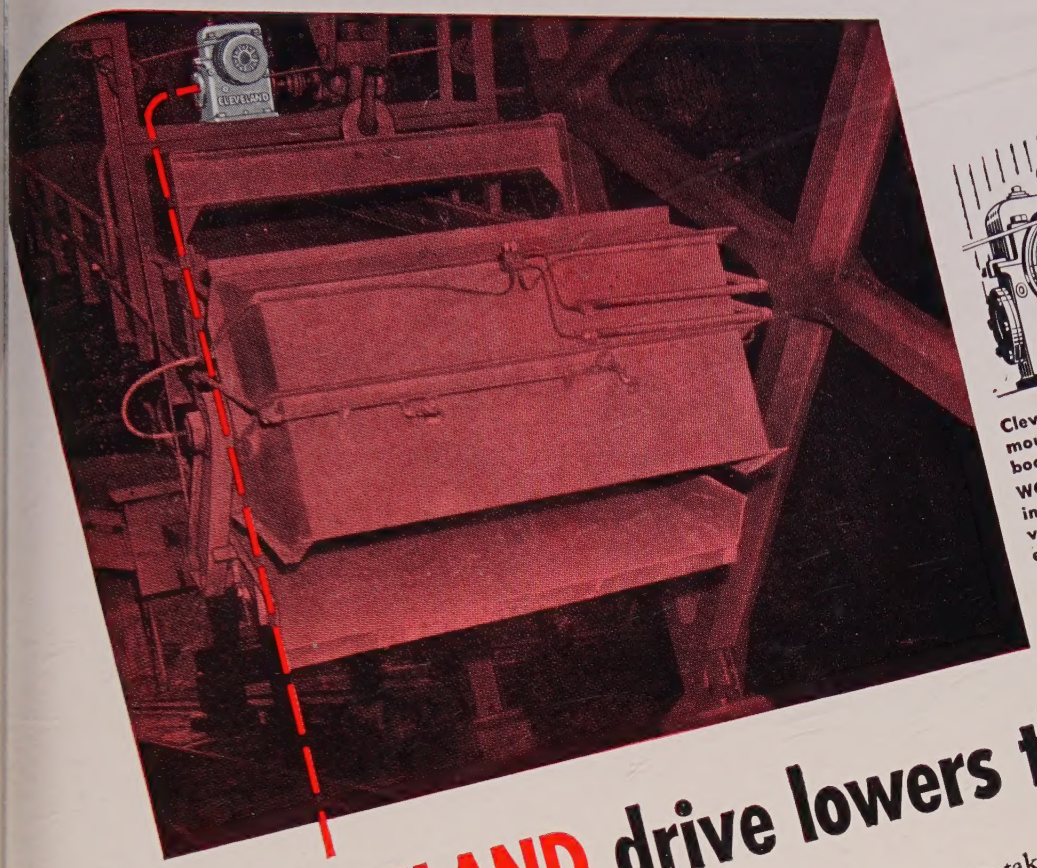
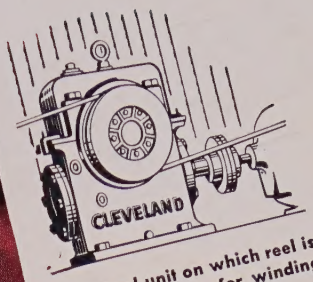




Cleveland unit on which reel is mounted directly, for winding boom lifting cables.
WORM GEARING — universal in its application—affords advantages for almost every power transmission job. Select worm gearing units to meet your need from the complete Cleveland line.

Rugged CLEVELAND drive lowers the boom

TO lower, hold and raise this coal-heavy boom takes a rugged drive. That's why a West Virginia coal company installed Cleveland worm gear speed reducers to handle four loading booms which will feed coal to waiting railroad cars. No matter what shocks and strains it has to take, each Cleveland will play out and reel in the boom cable, smoothly, day after day, year after year.

Clevelands work on any job without noticeable wear because they are made from finest materials, case-hardened steel worm meshing with low friction bronze gear. Gear and worm run in an oil bath, encased in a dust-proof, moisture-proof housing.

Wherever you want a compact, right-angle drive that performs efficiently under all conditions, call on Cleveland. Write today for Catalog 400, which presents the complete Cleveland line. The Cleveland Worm & Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

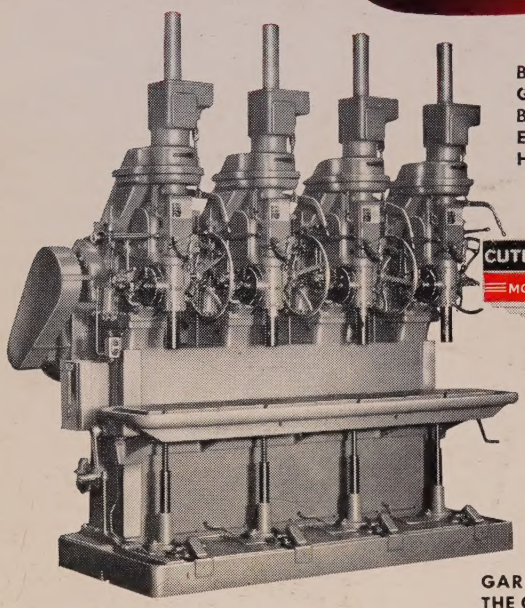
CUTLER-HAMMER

MOTOR CONTROL

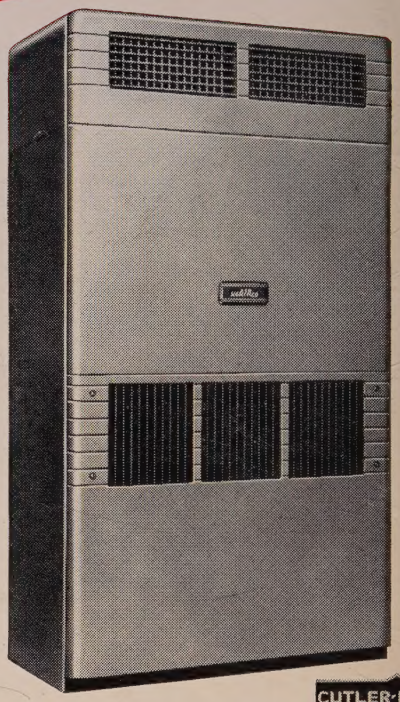
C-H

CHOICE OF THE LEADERS

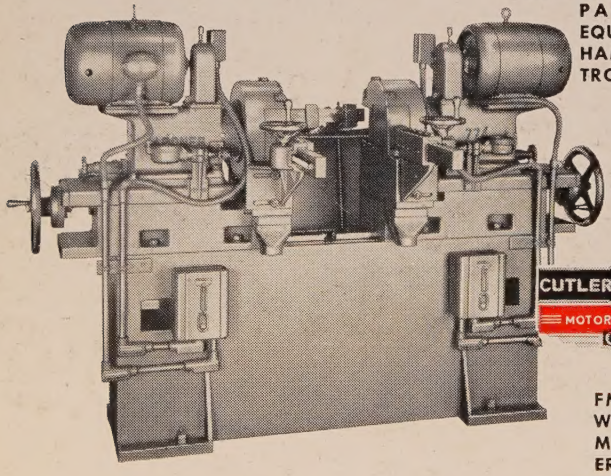
THE MARK OF BETTER MACHINES



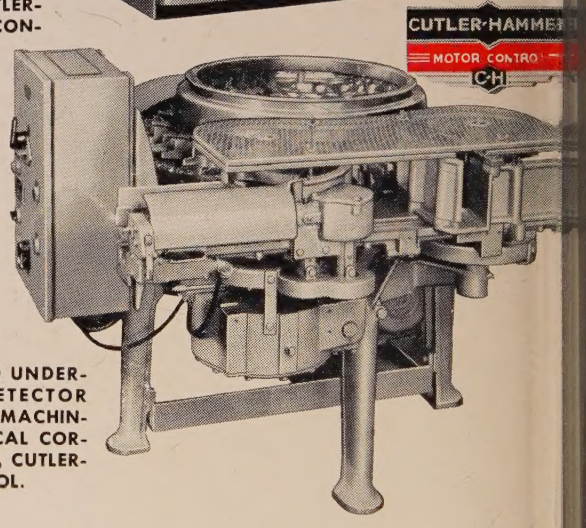
BARNESDRIL FOUR SPINDLE GANG DRILL MADE BY THE BARNES DRILL CO. FULLY EQUIPPED WITH CUTLER-HAMMER CONTROL.



3 TON "STORE CONDITIONER," ONE MODEL IN A COMPLETE LINE OF AIR CONDITIONING UNITS MADE BY U. S. AIR CONDITIONING CORPORATION. CUTLER-HAMMER CONTROL EQUIPMENT IS STANDARD.



GARDNER GRINDER MADE BY THE GARDNER MACHINE COMPANY. COMPLETELY EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.



FMC HIGH SPEED UNDERWEIGHT CAN DETECTOR MADE BY FOOD MACHINERY AND CHEMICAL CORPORATION. 100% CUTLER-HAMMER CONTROL.

When *name* becomes a *mark* of *merit*

In every field there are a few manufacturers who enjoy a great advantage. Their name or trademark on a product immediately identifies the product *as superior*. Their mark is taken as an assurance of unusual satisfaction to the product's user. This ready and unfailing association of name with merit is a tremendous commercial advantage . . . one its owners justly guard with care. But never to be overlooked in this linking of *name* and *quality* is the constant coupling of *product* and *satisfaction*. Never to be overlooked is that any company seeking to retain its leadership *cannot* permit the association to be broken. Such leaders therefore exert scrupulous and exacting care over every element entering the product . . . over every detail influencing product performance in the hands of the user.

It must be evident then that when leading machinery manufacturers continuously and repeatedly select Cutler-Hammer Motor Control for their machines, they do so but for one reason. And that reason is a *good* reason for *you* to specify Cutler-Hammer Motor Control for your machines as well. CUTLER-HAMMER, Inc. 1211 St. Paul Ave., Milwaukee 1, Wis. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.